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ABSTRACT

The theme of this special double serial issue is "Distance Education in Papua New Guinea." The following articles are featured: (1) "Distance Education in Papua New Guinea" (John Lynch); (2) "Distance Education in Papua New Guinea: Context, Issues and Prospects" (Michael Crossley and Richard Guy); (3) "Distance Education at the University of Papua New Guinea: Issues and Developments" (Howard Van Trease); (4) "Distance Education and the Professional Development of Teachers in Papua New Guinea" (Michael Crossley); (5) "Past and Future Distance Education Models of the Advanced Diploma in Teaching--Goroka Teachers' College" (Norma Simpson); (6) "Up There with the Angels: Provincial University Centers in Papua New Guinea" (Graeme Kemelfield); (7) "Distance Education at the Pacific Adventist College: An Evaluation" (Laurie Meintjes); (8) "What Matters in Face-to-Face and Distance Learning of Matriculation Mathematics?" (Gurcharn Singh Kaeley); (9) "The Economics of Distance Education" (Gerard Guthrie); (10) "Distance Education, Text and Ideology in Papua New Guinea" (Richard Guy); (11) "Developments and Directions in Social Science Distance Education at the University of Papua New Guinea" (Anne Crossley); (12) "Distance Education and the Education of Librarians in Papua New Guinea--A Note on Planned Developments" (John Evans); (13) "Teaching Science by Distance Education: A Perspective" (Geryk John); (14) "Distance Education in Papua New Guinea: Access, Equity and Funding Issues at the College of Distance Education and the University of Papua New Guinea" (Dikana Kema and Richard Guy); (15) "The Papua New Guinea Association for Distance Education: Background and Purpose" (Michael Monsell-Davis); (16) "In Search of an Effective English Language Placement Test for Extension Studies at the University of Papua New Guinea" (Angela Phillip). Two brief research notes--"School Organization Climate and Student Discipline" (Arnold Kukari); and "The Feasibility of Universal Primary Education for the Southern Highlands Province in Papua New Guinea" (Sam Kari). (ALF)

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FOREWORD

As we move into the 1990s, it is most appropriate that the *Papua New Guinea Journal of Education* should be producing a Special Issue on distance education in Papua New Guinea

The 1980s have seen the demand for education at all levels increase dramatically in Papua New Guinea. Successive governments have stressed universal primary education and the expansion of other components of the formal education sector, and considerable attention has been paid to non-formal education. At the same time, the 1980s have been seen inadequate financial support to our education system, personnel problems which prevent schools and education institutions from being adequately staffed, and personal problems of many kinds which prevent a large number of Papua New Guineans from furthering their education.

But in addition to all of this, the 1980s have also seen the beginning of a real expansion in distance education, a trend which will surely continue into the 1990s. Distance education provides a relatively cheap and cost-effective way of satisfying the increasing demand for education without the prohibitive financial costs which other delivery systems can incur. The man or woman living and working in a rural town or village may have no real chance of furthering his or her education by attending a school, college or university in one of the larger cities. This may be due to family pressures, inability to be released from work, lack of sponsorship, or a whole host of other reasons. However, such individuals have a very real chance of furthering their education by enrolling through College of Distance Education, UPNG'S external programmes, and similar bodies, at no significant cost to themselves, their families, or their employers. It takes motivation, and sheer hard work, but it can be done.

The growth in distance education in recent years, especially at the upper secondary and tertiary levels, has been phenomenal. Where not long ago a few hundred Papua New Guineans were enrolled at UPNG in a 'bits-and-pieces' programme that was limping along, now many thousands are enrolled in a variety of programmes, and the next few years will see further expansion in enrolments and in courses and programmes offered through this mode.

There are, however, still many problems which have to be faced and solved. On the one hand there are the administrative, academic and financial problems - improving delivery systems, problems of decentralisation and coordination, difficulties in funding and staffing, and major issues of curriculum and course design. On the other hand there are the student-related problems - reducing attrition rates, maintaining motivational levels, the problems of standards and so on. These problems, and many other, will be with us for some time. But the recent pleasing positive approach towards distance education from a number of quarters should provide a reasonable context in which the solutions to these problems can be found.

John Lynch
Vice-Chancellor
University of Papua New Guinea

EDITORIAL

DISTANCE EDUCATION IN PAPUA NEW GUINEA: CONTEXT ISSUES AND PROSPECTS

Michael Crossley and Richard Guy

The 1980s were difficult times for education world wide as public spending upon social services was challenged and financial resources were increasingly turned towards the more directly economically productive sectors of society. The search for improved "efficiency" and "cost-effectiveness" dominated much of the educational planning and policy debate of the decade, and financial support for innovative ventures inevitably declined. In Papua New Guinea times were also hard and the attention of educationalists, planners, and policy-makers was rapidly focused upon financial matters, problems of budgetary constraint and ways of rationalising, and maximising the use of scarce resources.

At the higher education level, for example, the search for ways of reducing the large and disparate range of separate institutions dominated the agenda - and markedly influenced the concerns and priorities of the new *National Higher Education Plan* which recently reported that:

> The present higher education situation is characterised by an unacceptably high unit costs of producing graduates, high student attrition rates, and much wastage and underutilisation of resources (building, equipment, teaching staff ...) (Commission for Higher Education 1990:i)

On the other hand, while economic constraints dominated the educational debate, and greater cost effectiveness was seen to be essential, commitment to improve access to educational opportunities was staunchly defended by Papua New Guinean decision makers.

In this difficult socio-economic context distance education attracted considerable attention as a viable strategy for increasing access to education, and better utilising existing resources, in a more cost-effective manner. Perhaps somewhat ironically, it can be argued that as budgets contracted distance education came of age and came to be accepted as an important component of education systems worldwide.

The international influence of the British Open University (Perry 1976) is well known, but the 1980s were marked by the spread of similar institutions throughout developing countries. In India for example, the Indira Gandhi National University was established in 1985, and in Thailand the Sukhothai Thammathirat Open University has successfully grown to attract widespread attention both at home and abroad.

Perhaps the most notable international development of the 1980s was the establishment of the Commonwealth of Learning (COL) initiative in 1988, with its Headquarters in Vancouver, Canada. To cite the first *COL Newsletter*:

> The Commonwealth of Learning has three overall goals; To promote the sharing of distance teaching materials, and to support the development of new course

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> materials which meet particular needs in the various countries of the Commonwealth. To strengthen institutional capacities by providing staff training, fostering communications, establishing an information services network on distance education and supporting collaboration in evaluation and research. To assist distance education institutions to provide better services to students, improving study support systems, and facilitating the transfer of credit between Commonwealth institutions.

Such goals reflect both the extent of international interest in distance education and high-level commitment to collaborative strategies for support and action across the developed and developing countries of the Commonwealth. Times will indeed be exciting for distance educators if such initiatives prosper.

Returning closer to home, the Pacific region itself is especially notable for work in this field with the regional University of the South Pacific (USP) being recognised as a world leader in distance education; and attracting international attention to its thriving network of university centres, its wide range of external courses, and its pioneering work with satellite and telecommunications systems (Crocombe and Meleisea 1988).

Collaboration has already been initiated between USP and UPNG with regard to distance education but, as Monsell-Davis and Naidu (1989) point out "UPNG has been much slower in building viable programmes of distance teaching and adult education, despite the recommendations of numerous official reports from 1964 onwards" (1989: 185-186). According to these authors the demands of regional governments (contributing to the University of the South Pacific budget) for a university presence in their islands, strengthened the efforts of early supporters for external studies and university centres at USP. Such pressures were less significant in Papua New Guinea.

As the papers in the present volume amply demonstrate, however, the momentum of the distance education movement has increased at all levels of the education system throughout the 1980s in Papua New Guinea. Moreover, 15 March 1990 saw the formal establishment of the Papua New Guinea Association of Distance Education with the aim of promoting "the sound and effective practice of distance education throughout Papua New Guinea, and to foster a wider appreciation and understanding of the theory behind that practice" (PNGADE 1990: 1).

This Special Issue of the *Papua New Guinea Journal of Education* was planned to support such nationwide developments by better informing distance educators about the many and varied initiatives already underway. The collected papers also draw attention to common issues experienced by distance educators in Papua New Guinea, in addition to highlighting the prospects for this mode of teaching and learning in a nation where educational and training opportunities remain especially limited in the many isolated, rural and inaccessible parts of the country. Attention is also given to more theoretical aspects of distance education by some of our contributors while many focus upon the practical and logistical dilemmas that must be faced by those charged with translating policies and plans into successful practice.

Howard Van Trease provides frank and wide-ranging reflections on the development of distance education at the University of Papua New Guinea during the latter part of the 1980s. Much of what he writes about substantiates Professor John Lynch's description, in the foreword to this volume, that 'not long ago' distance education 'was limping along in Papua New Guinea. The paper describes many of the substantial gains made in distance education since that time. It is a lengthy paper but it will be of interest to future scholars in that it is one of the few papers which documents the early growth and development of distance education by a central player in those events. The argument outlines long overdue steps for distance education to take within the University if it is to enter a new phase of growth and development. Above all the paper highlights the need for effective organisational planning and the development of an adequate infrastructure to support distance education initiatives. This is not surprising and adds further weight to the argument that these two areas represent the most serious shortcomings in distance education throughout the developing world (Jenkins 1989).

Distance education in the developing world has probably been most extensively used in the area of teacher education (Brophy and Dudley 1983). Michael Crossley reviews international developments in external teacher education and outlines the prospects that distance education offers for the inservice education of teachers in Papua New Guinea. He advocates improvements to existing inservice education, which emphasises the expansion of subject knowledge and basic skills competencies, by suggesting that notions of critical reflection and reflective teaching be incorporated into future distance materials and courses.

It is often claimed that distance education can improve the access of women to educational opportunities especially in the developing world (Mandie-Filer 1989). Norma Simpson is concerned about women and distance education in terms of organisational models which, in themselves, may discriminate against the wide participation of women in distance education programmes; she then illustrates from a practitioners point of view, possible solutions to this issue. Dikana Kema and Richard Guy look more closely at the issue of female involvement in distance education in Papua New Guinea and provide a statistical analysis of relevant participation rates. They also analyses the funding arrangements for distance education and, despite significant growth in enrolments throughout the country, conclude that funding is disproportionate to enrolments.

Part of the folklore of distance education is the claim that it is a cost effective response to educational problems in the developing world. This has been an extensively researched issue (Rumble 1988) and Gerard Guthrie reminds us of the need to examine this issue carefully. He points out that the viability of distance education programmes is dependent on the crucial relationship between the size of student populations and the cost of producing materials. The size of enrolments in programmes in Papua New Guinea may not warrant a large investment in distance education but the lack of mainstream educational development, the exceedingly high cost of providing such facilities, and the difficult nature of the geographical context, will continue to act s an impetus for the development of distance education in this country.

Distance education courses are conducted in the English medium in Papua New Guinea which for the majority of students is their second and in many cases their third language. Angela Phillip's paper discusses the need to assess the proficiency of students in English language before engaging in appropriate distance education courses. Her research suggests that a cloze test is the most desirable placement instrument in Papua New Guinea. Geryk John, who is also concerned with entry standards, discusses the considerable difficulties that students encounter with science based courses. He suggests ways to overcome these problems but the issue of laboratory time, which is of concern to all science based distance education courses throughout the world, takes on an additional dimension in Papua New Guinea.

Gurcharn Singh Kaeley investigates socio-economic, entry style and instructional variables in relation to students and mathematics distance education courses, and concludes that there are significant relationships between these variables and the achievement of distance education students undertaking mathematics in Papua New Guinea. Anne Crossley outlines the context of social science distance education and the substantial constraints affecting practice. Attrition and success rates in these courses are documented and the author argues that it is now timely for the priority of rapid quantitative expansion in enrolments to be augmented by one which pays increased attention to the quality of the materials produced, and of the support services offered in Papua New Guinea. It has been argued elsewhere (Monsell-Davis and Naidu 1989) that one way of achieving quality in distance education is through the efficient use of resources and sharing existing courses with other distance education institutions. John Evans outlines some of the limitations and possibilities of this in relation to efforts made to share librarianship courses between the University of Papua New Guinea and the University of the South Pacific.

The number of institutions which are incorporating distance education methodologies into their practice is expanding in Papua New Guinea. The Seventh Day Adventist Church has adopted a distance education strategy for the South Pacific and Laurie Meintjes documents many of the problems faced by the distance education unit at the Pacific Adventist College as it attempts to find a foothold alongside conventional education. There is a suggestion in his paper of the potential for wasteful duplication of distance education resources in a relatively small country or region, which may become a larger issue as more and more organisations take up distance education. His article illustrates the diversity of organisations in distance education in Papua New Guinea which has provided some of the stimulus for the establishment of the Papua New Guinea Association for Distance Education about which Michael Monsell-Davis writes in some detail. The growth in institutional diversity suggests that sociological and ideological implications of distance education will need to be addressed before too long in this country.

Graeme Kemelfield provides us with an interesting insight into this area and the responsiblities that face distance education. He debates the role of provincial university centres in Papua New Guinea which are major student support structures for distance students, but also have important roles to play in the area of continuing education. The paper details some of the activities of the North Solomons University Centre which have an identifiable ideological base. Recent events in the North Solomons Province illustrate, rather graphically, the relationship that university centres may establish with the wider community and that they are not isolated from evolving political and social contexts in the community that they serve. Ideology in distance education is an issue that equally concerns Richard Guy but in terms of the ideology that is contained in the form of text which is so central to distance education. He outlines the form of text in terms of technocratic, interpretive and critical rationalities. Examples of text are provided and he discusses the consequences that the form of text has for student learning.

This collection of papers is a significant addition to the relatively small body of literature relating to distance education in Papua New Guinea. The value of this collection may be measured partly in terms of its immediacy. A concern to assist in the continuity of development is also reflected by the fact that a number of important players in events, who have left or are shortly to leave Papua

New Guinea, have documented and reflected upon their theories and practices of distance education. Many issues are raised in the papers which require further study, reflection and debate; but we would encourage this to be wide-ranging in nature for there is often a tendency for research in this arena to be rather positivistic and concerned simply with the organisation of distance education programmes and the examination achievements of students.

There are also gaps in much of the international literature about appropriate research methodologies (the book review by Helgi Eyford is of interest here), and the assumptions that the theory and practice of distance education bring with it in terms of social and cultural contexts. While we hope the present volume will provide a focal point for those studying distance education in Papua New Guinea, there clearly exists an urgent need for more research in this country which is sensitive to the international literature but, more importantly, relates directly to the nature of Papua New Guinean distance students and their approaches to learning; to the quality and relevance of materials; to assistance for disadvantaged groups; to the language of instruction; and to the nature and appropriateness of delivery strategies. If this collection of papers helps to stimulate such research and development, distance education in Papua New Guinea will indeed benefit from improved guidance in the future.

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DISTANCE EDUCATION AT THE UNIVERSITY OF PAPUA NEW GUINEA: ISSUES AND DEVELOPMENTS

Howard Van Trease

This paper will describe the development of the University of Papua New Guinea's distance education program — focusing primarily on the period since the mid-1980s — which has created an alternative staircase of courses bridging the wide gap between secondary and tertiary education. By doing this, the University's Extension Studies Department has made a major contribution to higher education in Papua New Guinea. It will be shown how a number of crucial issues have still to be resolved in order for further progress to be made. The issues examined will include the administrative setting of the University, allocation of resources, the status of distance education and the perceptions of provincial governments.

There is great potential in Papua New Guinea for the development of distance education. The physical nature of the country with scattered centres of population (19 provinces plus the National Capital District) and problems of transport make learning at a distance the only option for many of PNG's nearly four million people. The country's late start in providing education at all levels and the very small number of young people finishing school today mean that the country is short of trained manpower and will continue to be in the forseeable future.

The problem begins at primary level, where in 1990, only 73.2% of eligible children (413,089 out of 564,530) were enrolled in grades 1 to 6. Even more serious is the low number of young people who then go on to high school; in 1990, only 34.5% of those eligible (16,366 out of the 47,313 who finished the country's community schools) were able to enrol in Grade 7. Fortunately, the possibility exists for anyone who does not make it into high school and is capable, to continue studies through the College of Distance Education which offers the full Grades 7 to 10 program by distance means.

The severity of the wastage problem becomes most evident at tertiary level. In PNG, the first stage of high school education finishes at Grade 10. From those who complete, 1,200 are chosen each year to go on to the four National High School to do Grades 11 and 12.

In addition, around 3,000 Grade 10 leavers enter one of the various training colleges (e.g. teacher training for community schools, health care, agriculture, fisheries, trade and technical) for programs of study lasting normally from one to three years. In 1990, of the 10,216 students who finished Grade 10, only 9.8% were able to go on to National High School — completion of Grade 12 or the equivalent is required for entry into university. Furthermore, the National Department of Education report that only 69% of the 1989 Grade 12 leavers (664 out of 962) went on to tertiary level study in 1990. There are 1,300 first year places available at the three tertiary institutions in Papua New Guinea requiring Grade 12 for entry (University of Papua New Guinea (UPNG), 600; Goroka Teachers' College (GTC), 200; University of Technology (UNITECH), 500; which translates into a poor performance by the country's formal education system, providing in 1990 a mere 51% of the qualified high school graduates required. The shortfall is usually filled with non-school leavers who have Grade 10 or other relevant training and work experience. However, in some

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cases the places are not filled at all — for example, for programs at UNITECH and the Science Faculty at UPNG which require a high level of competence in science and mathematics.

Origins

An obvious option for educators in Papua New Guinea is distance education. Indeed, this fact was recognised by early planners who envisaged distance and continuing education as necessary functions of the the University of Papua New Guinea. The *Currie Commission Report* (1964:146), which provided the basis for the establishment of the University, stated firmly that UPNG would teach both internally and externally: "If suitable potential students cannot go to the University, then the University must go to them . . .". Subsequently, this external studies requirement was written in as the fourth of the five "Objects of the University" in *The University of Papua New Guinea Ordinance, 1965-1973*. Despite such clear statements, however, Extension Studies failed during this founding period to receive the crucial support it needed to become an integral part of the University's operation. It was not set up with full departmental or faculty status, but remained simply a series of activities carried out on an *ad hoc* basis.

The success of the Lahara (summer school) sessions which began in the early 1970s gave an indication of the unmet demand for external studies in Papua New Guinea. However, without demeaning the efforts of staff involved, students were only offered an uncoordinated series of degree credit courses. No plan existed — nor, indeed, was there any real desire by the University community at that time - to establish an external studies program. The Lahara sessions were administered by a committee which was little more than a mixed grouping of enthusiasts with shifting membership and no real basis of influence on University policy.

In 1974, ten years after Currie, the *Report of the Committee of Enquiry into University Development*, was published, commonly known as the Gris Report after the name of its chairman. Gris went much further than Currie, spelling out in considerable detail the rationale, programs, organisational structure and budgeting arrangements required for external studies. He recommended the establishment of a true outreach program for the University including the expansion of Lahara — integrating it with external studies — and the establishment of a network of regional centres aimed at providing educational opportunities outside the UPNG campus.

The Gris Report's recommendations relating to Extension Studies were for the most part ignored — despite the fact that Gabriel Gris himself served as Vice-Chancellor from 1975 to 1977. The problem again was that the Gris Report failed to address the key issue of how the proposals about Extension Studies were to be realised without a firm institutional base. It recommended that a "Board of Extension Activities" be established, rather than creating a unit with faculty status, which would have given the Director access to the political and financial power structure of the University — a necessary move to bring about the reallocation of resources required to allow external and continuing education to become firmly established and developed. Extension Studies, however, remained a series of policy objectives unrelated to action.

Nevertheless, in 1975 the first Director of Extension Studies was appointed and in 1976 the first extension courses were introduced. In 1977, all University departments were asked to include in their planning estimates of staffing requirements needed for existing and projected extension teaching, the aim being to determine what additional resources teaching departments would require to enable them to develop and service a program of extension courses. The momentum was beginning to build at this time in favour of reallocating some of the University's resources to Extension Studies. However, all was lost, when the Academic Development Committee and Academic Board ruled that external teaching could not be included in internal staffing estimates and was to be considered an additional activity. Following from this decision the University requested that the National Government fund Extension Studies at UPNG as a new project. The National Government rejected the NPEP proposal, which the Director of Extension Studies had prepared, on the grounds that it did not consider Extension Studies a new project and because it correctly perceived that the University had no real commitment to the development of Extension Studies as evidenced by the decision not to reallocate resources internally.

In 1978, Academic Board reversed its earlier position, but the effect of the initial bad decision has been felt ever since — since the late 1970s, very few new extension courses have been prepared by University staff members outside the Extension Studies Department. To this day, many academic staff at UPNG still hold the mistaken belief that Extension Studies is an extra activity for which they are not responsible, despite the fact that the obligation to teach by extension and during Lahara sessions is clearly stated in each and every contract of employment. In addition, there is still opposition to the reallocation of existing staff resources to those departments wishing to develop their extension programs.

Extension Studies survived the 1977 crisis, due in large part to the dedication of a small group of staff members, both within the Department and elsewhere in the University. By 1978, the number of full-time permanent Extension Studies staff stood at four, including the Director, plus a number of full-time temporary staff hired to write courses or coordinate special projects. The Department focused its efforts on developing the Adult Matriculation program, improving existing Arts Foundation and Law courses and introducing various enrichment courses and programs. Very important at this time was the decision taken in 1980 to create an Extension Studies Department and make it part of the Faculty of Education — an important step in correcting a significant deficiency which had severely hampered the development of Extension Studies for years — its lack of an institutional base.

A new Director, appointed in 1981 at Professorial level, negotiated the establishment of the first three University Centres in the provinces of North Solomons, East New Britain and Madang. Resources were, however, again an issue — the University was unable to provide financing and as a result, provincial governments were asked to fund the running costs. While this meant a slower expansion of the centre network, since the establishment of a University Centre depended on the decision of each particular province to provide funding, it did have certain advantages in the long run. When budget cuts were imposed on the University in the second half of the 1980s, the Extension Studies Department itself felt the squeeze, but University Centres could not be touched since they were funded from outside sources. Having provincial governments directly involved in the running of University Centres also has made the University as a whole more politically sensitive to the obligation it has to decentralise. In the long run, pressure exerted by vocal provincial government leaders who are providing the finance to run their Centres may become an important factor in getting the University to fully accept the responsibility it has to provide a complete range of extension courses and programs to Papua New Guineans throughout the country.

Enrolment Trends

For the reasons already discussed, the University of Papua New Guinea has at present only a limited number of courses and programs offered through the distance mode. Until recently, the only courses available were those which corresponded to the first years of academic study available at the University, i.e. Preliminary Year (equivalent to Grades 11 and 12 at the National High Schools — discontinued as a full-time program at UPNG in 1987) and a few first year (Foundation level) degree courses available in the Arts and Law faculties. More recently, several new diploma programs have been introduced by the Education and Arts faculties at UPNG which will be offered through the distance mode, combining both new and existing courses at Adult Matriculation and first year degree level. In 1990, the Department offered a total of 28 courses at various levels. This compares to the Extension Services Department of the University of the South Pacific, which has been in operation for about the same period of time and has a total program of well over 150 courses.

Despite the limited course offerings, registrations have increased dramatically over the past few years, reflecting the strong demand among Papua New Guineans to improve themselves academically and their willingness to do this through distance learning.

Table 1: Extension Studies Course Registrations From 1985 to 1990

Level	1985	1986	1987	1988	1989	1990
Pre-Matriculation		646	749	884	1 355	1 201
Adult Matriculation	529	1 053	1 724	1 960	2 894	3 022
Foundation/Degree	326	562	398	323	461	361
Total	**855**	**2 261**	**2 871**	**3 167**	**4 710**	**4 584**

Note: Totals are for two semesters plus Lahara sessions each year for the Waigani Campus and all University Centres.

The Major factor in the growth in registrations has been the increase in the number of University Centres in operation (up from three to ten since 1985), the organisation of tutorial support groups in those provinces without Centres and the introduction of several new programs. Enrolments in the National Capital District amount to about one-third of the total. The decline in total enrolments in 1990 was due to disturbances in various parts of the country which disrupted the studies of extension students, i.e. the Bougainville crisis resulting in the closure of the University Centre in North Solomons Province, tribal fighting in some Highlands provinces and the down-scaling of the East Sepik University Centre's operation due to reduced funding from the Provincial

Government. It is anticipated, however, that registrations will increase again once these difficulties are overcome and with the opening of new University Centres.

The expansion of course offerings during Lahara and the mounting of sessions in the University Centres are other factors which have contributed to the increase in overall enrolments. In addition, in 1985, the format of the Lahara session was tightened — reducing it from nine to the six weeks just prior to Christmas. Students, in effect, do full-time study, taking no more than two courses with at least two hours of instruction every day for each. Results on the whole are very good and students appreciate the opportunity to be able to complete their extension programs more quickly. In addition, the shorter time period and opportunity to spend time outside Port Moresby seem to have made Lahara teaching more attractive to some University staff.

It should be noted that the Department has never mounted an intensive drive for new enrolments, but has relied mainly on brief newspaper advertisements at registration time. To do more would produce numbers which would overwhelm its meagre resources. This is an unfortunate situation. The addition of a few additional staff positions within the Department of Extension Studies would enable the University to cater for the huge demand for further study clearly present in the country and thereby contribute significantly to achieving the stated national goal of expanding educational opportunities for Papua New Guineans.

Academic Programs

In terms of numbers, Adult Matriculation is the most important program offered by the Extension Studies Department. The reason for this, as already noted, is that the opportunity for Grade 10 leavers to continue academic studies is very limited in Papua New Guinea. In addition to the 1,200 places available at the four National High Schools and the various professional and technical training programs on offer, there are several privately run religious institutions in PNG which offer their own Grades 11 and 12 programs, but the number of places available is limited. Moreover, several years ago, both UPNG and UNITECH discontinued their full-time Preliminary Years — one year study programs equivalent to Grades 11 and 12 — which had been established in the early years of the two universities before the existence of the National High Schools. The Adult Matriculation program offered through Extension Studies at UPNG has become, therefore, the main option for the majority of people interested in gaining access to university studies, including as well most who have completed other post-Grade 10 training.

Adult Matriculation is the only program for which the Extension Studies Department has full responsibility, i.e. for planning, writing courses and setting and marking assignments and examinations. For this reason, the Department has been able to introduce a number of innovations in the organisation and running of the program. For example, while the entry level into the Adult Matriculation program is completion of Grade 10, the Department places the greatest emphasis on the performance of applicants on skills placement tests in English and Mathematics introduced for the first time in 1986, rather than on actual past performance in high school.

The tests have shown that the majority of applicants are, indeed, not qualified to begin Adult Matriculation studies immediately, but require some initial remedial work. For this reason, the Department introduced two new Pre-Matriculation courses designed to give such individuals the opportunity to upgrade their competance in English and/or mathematics to a standard which should enable them to succeed in Adult Matriculation level courses. Once students pass Basic English and/or Basic Mathematics, they are then permitted to undertake Adult Matriculation courses. Those applicants who do not qualify to enter the Pre-Matriculation courses (at present about 20% of those tested) can if they choose to upgrade their high school results by enrolling with the College of Distance Education, which as noted above provides a full program of courses by extension for Grades 7 to 10.

The Adult Matriculation program consists of eight courses with specialisations possible in either social science/arts or mathematics/science. Students are required to do two courses in English and one in mathematics, which they must pass with marks of 50% or better, and another entitled the History of Science and Technology. The remaining four are selected from courses available in either of the above two broad areas of study. An overall pass rate of 50% must be maintained in order to matriculate. Students may be exempted from courses in the UPNG program by passing the final examination in those courses with an above average mark. This will become more important in the future as more students who have already completed post grade 10 training courses at other institutions apply to do Adult Matriculation in order to gain access to university degree level studies, e.g. people who already have completed certificates or diplomas in such areas as agriculture, health and accounting.

The completion of the Adult Matriculation program at UPNG has taken on a different meaning from that in some metropolitan countries in that it does not automatically provide admission into University, but merely recognises the achievement of an equivalent level of education to that of Grades 11 and 12. Not all matriculants would be accepted by UPNG and UNITECH for diploma or degree programs — only those with above average performances. Indeed, not all students do extension studies to gain admission to university studies — for some, the goal is to improve employment opportunities or simply out of interest or for self-improvement. The Police Force, for example, issued a directive several years ago advising all policemen and women to make an effort to upgrade their basic education — for those who had not completed Grade 10 to do so through the College of Distance Education and for Grade 10 leavers to attempt Adult Matriculation through the Extension Studies Department at UPNG.

Feedback which the Department has begun to receive on the overall performance of UPNG matriculants in their university studies is very encouraging. While more research needs to be done in this area, there is a clear indication that their performance in comparison to Grade 12 leavers is every bit as good at least in terms of their survival in full-time programs. This is understandable, since a first year degree student who has completed Adult Matriculation would be more mature and will have learned valuable study skills by having successfully completed his or her program through the distance mode.

A similar procedure is also followed for admission of students to extension courses at Foundation/Degree level. Grade 12 leavers are given placement tests and if found deficient are required to repeat courses at Adult Matriculation level before beginning diploma or degree level studies. As already noted, the number of Foundation/Degree level courses on offer is limited and the number of enrolments is not large. Like Adult Matriculation, most students enrol to gain admission to full-time study at UPNG, since most of the courses are simply part of the first year Arts and Law programs and do not otherwise lead to any particular qualification. The exceptions to this are the education courses which form part of the new Diploma in Teaching for community school teachers and the first year of the Bachelor of Education (In-Service). In the latter case, students are also required to enrol full-time for one year to complete the degree.

Over the next few years, the impact of the rise in extension studies enrolments — especially in the Adult Matriculation program — is certain to have an impact on admissions to full-time study at both UPNG and UNITECH. Already in 1990, a total of 70 students who matriculated or completed at least some courses through the Extension Studies Department were admitted to the two universities. From the above table of registration statistics, it is clear that the number will continue to increase over the next few years and remain at a fairly high level for some years to come. Indeed, within the near future, the Extension Studies Department at UPNG may be contributing the equivalent number of new first year students to the two universities through its Adult Matriculation program as that of a National High School. Given the fact that it costs over K900,000 annually to run a National High School, the Department will not only be making a major contribution to education in Papua New Guinea, but doing so in a very cost-effective manner. The annual budget of the Extension Studies Department on the Waigani Campus is at present about K325,000. If the annual budgets of the ten University Centres are added to this (K20,000 for a total of K200,000) the total of K525,000 is still considerably less than that required to fund a National High School. Moreover, it must not be forgotten that the Department offers other programs and each of the University Centres has its own continuing education activities.

One important effect on the two universities, as the number of applications for admission increases from individuals with Adult Matriculation, will be a rise in the standard of the intake among non-school leavers, i.e. those who have not come directly from high school into university. In fact, it is now the practice of both UPNG and UNITECH to advise applicants who do not qualify for direct entry into their programs to first do courses through the Extension Studies Department at UPNG. Included in this group for both universities are individuals who have only completed Grade 10 as well as Grade 12 leavers who are deficient in particular subjects and need to upgrade their high school results. UPNG has also adopted the policy of encouraging full-time students who have been excluded on academic grounds to enrol in appropriate degree level extension courses.

As already discussed, it has been difficult to convince teaching departments in the University to devote staff resources to the externalisation of courses. However, a major breakthrough occurred several years ago when the Education Department at UPNG agreed to externalise courses which make up the first year of the two year In-Service Bachelor of Education, a program intended primarily for practising high school teachers and education administrators who already hold a Diploma in Teaching from the Goroka Teachers' College. Normally an In-Service B.Ed. student would undertake a two year program of full-time study to obtain the degree. Combining certain already externalised Arts Foundation courses with appropriate new education courses, it will be possible for high school teachers to complete the equivalent of one year of full-time study (eight courses) by extension.

This has been well received by both teachers and the National Department of Education. It means that high school teachers will only need to be released from their jobs for one year instead of two — a considerable savings in staff development costs for the National Department of Education or, looked at in another way, providing the opportunity to double the rate at which high school teachers can be released to complete degree studies. It also has the advantage for the National

Department of providing a selecting device for granting scholarships — someone who has successfuly completed eight extension courses at a distance has demonstrated the academic ability required to be able to complete the additional one year of fulltime study. In addition, since the majority of potential B.Ed. students are mature individuals — most of whom are married with families — one year away from home rather than two means less disruption and personal hardship.

With the exception of Adult Matriculation, the Education Department was also the first to introduce a program which students will be able to complete entirely by extension — the Diploma in Teaching (Primary) for community school teachers. In fact, the Diploma is not offered at all as a full-time program, but is available only to practising teachers who have completed the two year Certificate in Teaching from one of the country's teacher training colleges. The aim of the Diploma is to raise both the educational and professional level of community school teachers with a program consisting of four Adult Matriculation and eight degree level education and Arts Foundation Year courses.

Students are only required to do four courses at Adult Matriculation level before proceeding to degree level, concentrating on language and numeracy skills, instead of the normal eight which make up the full Adult Matriculation program. This, in effect, gives some credit for the two years of post Grade 10 studies that community school teachers undergo to obtain the Certificate of Teaching. It should be noted, however, that students are required to pass the four courses with above average marks, otherwise they must complete the full eight course Adult Matriculation program. All applicants are given the Department's English and Mathematics placement tests, and it has been found that the majority need to enrol in one or both of the Pre-Matriculation courses before starting their Diploma studies. Successful completion of the Diploma in Teaching can be used to apply for entry into the University's Bachelor of Education program.

A recent development related to the Diploma in Teaching has been the interest shown by the various teacher training colleges in the Adult Matriculation courses which are included in the first stage of the Diploma. The colleges are themselves in the process of developing the curriculum for a third year which future trainees will be required to take leading to their own Diploma in Teaching. Some staff at the colleges have indicated that they are considering the actual inclusion of UPNG Adult Matriculation courses into their programs — in particular, English and Mathematics. In 1990, in fact, the Holy Trinity Teachers' College in Mt. Hagen enrolled some of their first year students in the Mathematics 1 course. They paid a registration fee, used Extension Studies materials and did the normal assignments and examination, but they were taught the course by a Teachers' College instructor. A number of students passed the course and have, as a result, acquired a credit towards the UPNG Diploma in Teaching if they decide in future to upgrade their qualification further. This same arrangement, but using more courses, is now in its second year of operation at St. John's Seminary in East Sepik Province with the aim of upgrading the curriculum and at the same time providing helping seminarians the opportunity to gain some credit towards Adult Matriculation in case they do not continue their theological studies. Likewise, the Fisheries College in New Ireland, registered a number of its students in the two Adult Matriculation English courses which has given credits to those who passed if they ever wish to pursue the program further. While these developments are at present all rather *ad hoc*, they indicate that the quality of the UPNG Adult Matriculation program is recognised outside the University and should reinforce the argument that the Extension Studies Department is performing an extremely valuable outreach function for the University and deserves to be supported in its endeavours.

Another program presently being developed for teaching by extension is the Diploma in Commerce, which is offered jointly by UPNG and UNITECH. The Diploma requires Grade 12 or Adult Matriculation for entry and requires two years of fulltime study. It is based on the internationally recognised British Association of Accounting Technicians examination. Because neither the Department of Commerce at UPNG or the Department of Accounting and Business Studies at UNITECH has the staff resources to write all the required extension courses, a link has been arranged with Deakin University through the International Development Program of Universities and Colleges, funded by AIDAB, to provide assistance in writing some of the courses. UPNG and UNITECH will also contribute to the writing and it is anticipated that both Universities will share in the running of the courses once they are available. It is intended that lecturers at either institution will be able to teach a course through UPNG's University Centres. Because of the high demand expected for this program, it will be available by extension only in those provinces with University Centres.

It is anticipated that the extension program will be divided into two segments — the first ten courses now under development will comprise a Certificate and the second block, the Diploma. In addition to the joint writing and running of the courses by UPNG and UNITECH, another innovative aspect of this program is that once students have obtained the Diploma, it can be used as the basis for applying for entry at either university into the two year, follow-on Bachelor of Commerce Degree. A positive spinoff of these developments has been the establishment of a Committee on Accounting Education in PNG based in Port Moresby, consisting of representatives involved in training accountants from various private companies, Government departments and statutory bodies and the two Universities. The Director of Extension Studies is official secretary and the main focus of the Committee's efforts at present is the development and running of the extension version of the Diploma in Com-merce, indicating solid support from the wider community.

Another new program, which is the responsibility of the Arts Faculty as a whole rather than one particular department, is the Diploma in Industrial Relations. This Diploma did in fact exist in the early 1980s and was being developed as an extension program, when it was disbanded because of a lack of staff resources in the Sociology/Anthropology Department in which it was based. Its revival came about as a result of an appeal organised by the Director of the North Solomons University Centre in memory of a famous North Solomons labour leader, Mr. Henry Moses. Money was collected to help fund a position at UPNG to teach industrial relations. In addition, support was provided again by the International Development Program of the Australian Universities and Colleges for a lecturer from the University of Western Australia to come for a year to write the first extension course and get the program under way.

The Diploma is intended to provide training for men and women already employed in industrial relations or personnel functions. It provides courses in basic skills of numeracy and literacy, in important related areas of economics, history, sociology and psychology as well as in specialist industrial relations areas. Like the Diploma in Teaching (Primary), the Diploma in Industrial Relations will be offered only to extension students, although a number of the courses will also be taught on campus as part of other existing degree programs. The entry level is Grade 12. In addition, because a number of individuals interested in the Diploma already have completed university degrees, a post-graduate version of the Diploma will also be made available by extension. It will be shorter in length in the expectation that most students will already have undertaken a number of the skills and Foundation level courses as part of their undergraduate studies. In both versions, a small number of courses will be provided full-time during Lahara sessions, while the majority will be available by extension.

Along with Education, the Language and Literature Department is also making an effort to develop an extension program using its own limited resources. It has agreed on a new Diploma in Language Studies, which combines some of the Department's existing on-campus offerings plus some specialised courses in such things as translation techniques, literacy, and dictionary making. The entry point for the Diploma is Grade 12 or Adult Matriculation and it is intended for people already working in various language related jobs who lack formal training. Courses which make up a similar program developed at the Pacific Languages Unit of the University of the South Pacific in Vanuatu, have been made available for use or adaptation by the Department at UPNG. This should help to get a program available fairly quickly for use in Papua New Guinea. The Department already offers its introductory Arts Foundation course by extension and it is expected that the first of the new courses should be ready by 1992. The Summer Institute of Linguistics based at Ukarumpa in Eastern Highlands Province has also offered help in running the program once it is prepared. The Institute has the largest linguistic research and translation program in Papua New Guinea and employs many Papua New Guineans as informants and translators, who could benefit from a formal training program.

Over the past few years, the Extension Studies Department has tried to make its courses and programs more easily accessible by doing away with many of the restrictions placed on entry. Previously, students were required to be at least 21 years old and to have been employed for two years. These policies seemed very restrictive, especially for women and young people out of school with little prospect of finding employment, and they were eliminated. As already described, the use of placement tests instead of previous academic results to determine entry is intended to encourage people to give extension studies a try and recognises that there are many individuals who may not have done well in high school due to immaturity, poor teaching or personal problems, and not because of lack of ability. If they have continued to develop intellectually through their own personal efforts or other training, use of the placement test rather than depending solely on previous results as the basis for determining entry eligibility can significantly open up opportunities for able men and women throughout Papua New Guinea.

Another aspect of the Department's entry policy which relates to the use of placement tests is that individuals do not apply for admission into specific programs, but instead for entry into the individual courses that make up the program in which they are interested. New applicants are tested and counselled as to which courses they will be required to do in order to complete their desired programs. As already described, in some cases this may mean starting at a lower level because of certain academic deficiencies revealed by the placement tests. Their progress is monitored at each registration and when they have completed the required program of courses they apply to the Assistant Registrar (Extension Studies) to be awarded the particular certificate or diploma.

University Extension Centres

Following the establishment of the Department itself, the next most important decision made in the development of Extension Studies at UPNG was that of establishing a network of University Centres throughout the country. Given the problem of communication in Papua New Guinea, the decentralisation of the Department's operation had become an absolute necessity. The presence of a University Centre means that the people of the particular province, including isolated individuals living outside the provincial urban centres, have direct access to someone who can counsel and advise on courses and programs, do actual registration and collection of fees, distribute course materials, organise tutorials and local marking, and conduct final examinations.

When the first Centre was established in 1982 in the North Solomons, it was not clear whether each province would eventually have its own or whether regional centres serving several provinces would be more practical and cost effective. As of early 1990, a total of eleven centres have now been established, though as already noted, the North Solomons Centre has been closed due to the tensions at present going on in the Province. The centres at present in operation are: East New Britain, East Sepik, Enga, Madang, Manus, New Ireland, Southern Highlands, Western and West Sepik. Because the pressure for decentralisation on a provincial basis is increasing generally in Papua New Guinea, it is clear that in the end each province will want to have its own University Centre.

The reason why centres have not been established in all provinces is that a political decision is involved. It is in effect up to the particular province to decide whether or not to have a University Centre, since the provincial governments are responsible for running costs: salaries, housing, travel and office expenses. To formalise the establishment of a centre, an agreement is signed by senior officials from the province and the University, in which the responsibilities of each institution are laid out and the role and function of the centre defined. All provincial governments have been approached, but clearly not all politicians give the provision of tertiary educational opportunities a high priority.

Indeed, the present East Sepik Provincial Government has reversed the position taken by its predecessor and has refused for the past two years to provide enough funds to keep its University Centre running at full capacity. Despite lengthy discussions, the Provincial Government has taken the position that since they are not involved in the selection of the Centre Director, they should not have to pay the salary. As a result, no replacement was appointed when the last Director did not renew her contract in 1989. The Centre has been kept open by the secretary with a smaller grant from the Provincial Government, but the number of registrations has been reduced in order to cope with the loss of the Centre Director. The University's position is clear. Centre Directors are University staff members, albeit funded by provincial governments, and the issue of the academic freedom and independence of the institution is at issue. It is to prevent the appointment of centre directors becoming politicised that the University has retained the right of appointment — a point clearly stated in the agreement signed between the University and each provincial government. Last year, the committee set up by the National Government to draft a new National Plan for Higher Education noted this problem with the East Sepik Provincial Government and incorporated into the Plan the suggestion that the National Government should support UPNG's extension studies program by providing funds for staffing of the centres. This could be helpful in that it would cover a cost which seems to many provincial politicians to be outside their responsibility.

In addition to administering the Department's formal academic courses, Centre Directors are also responsible for developing continuing education programs for each of their provinces. They are urged to establish an Advisory Committee made up of community leaders to assist in planning the program which may include such things as public lectures and seminars, short courses, workshops and publications. They are free to plan their own events without direction from the main campus and may raise their own funds as required. This is not the strongest aspect of the University Centres' operations, which may reflect the heavy workload of staff. However, once directors have their academic courses running smoothly, they seem to be able to devote more time to non-formal activities with some quite good results.

Each Centre Director is responsible for the day-to-day running of the centre including the use of the grant provided by the provincial government. A Board of Management consisting of two representatives from the provincial government, possibly one non-government member and two from the University normally meets twice a year to review the centre's progress and accounts, plan the annual budget and make any major administrative decisions. The aim has been to allow centre directors as much freedom to operate as possible, by developing a system which does not impose a heavy administrative burden but provides only the necessary checks required to meet both University and provincial government requirements.

Administration

With the rapid increase in student enrolments and number of University Centres in operation, a top priority in recent years has been the improvement of the Department's administrative operation, which is focused on three areas: student administration, extension studies and accounts.

Over the past few years, procedures have been improved, new systems introduced where none existed before and staff positions upgraded. The Department itself still needs to improve some of its administrative operations, but given the rapid growth experienced recently, progress on the whole has been good. The sorts of problems which remain are often the result of events or situations beyond the control of the Department itself. In addition, for various reasons, the main University administration has been slow to respond to the needs of Extension Studies resulting more and more in the Department having to develop its own solutions to pressing administrative problems. Indeed, the trend which is emerging is that Extension Studies is gradually evolving into a separate administrative unit within the larger University — a development which has significant long-term financial and structural implications.

The area of accounts is a good example of the sort of problem the Department has had to deal with on its own. In 1985, University centre accounts were supposed to have been handled by the University Accounts Department. However, continual delays in payment from Port Moresby made it almost impossible for Centre Directors to operate and poor record keeping meant that the University was not able to provide accurate audited annual reports of university centre accounts to provincial governments. The Department, therefore, introduced a new decentralised system, adapted from that used by the University of the South Pacific, which allows Centre Directors to manage their own finances by operating a local chequing account. Each month they must submit a detailed report of debits and receipts plus a bank reconciliation. This has meant that Centre

Directors have had to acquire a certain degree of accounting expertise, but the result has been excellent. They now have the freedom they need to operate in the provinces away from the main campus and the Extension Studies Department is recognised as operating one of the most accurate and effective accounting systems in the University.

Unfortunately, the problem of providing audited annual reports to provincial governments still remains, despite the fact that the Extension Studies Department converted one of its scarce academic positions to an administrative one in order to establish a new position of Assistant Bursar. A fully qualified accountant has now been recruited. The centre accounts are not the problem, but rather that Extension Studies matters in the University Accounts Department itself are still confused and not up to date. This problem could be solved if responsibility was given to the Assistant Bursar to deal with Extension Studies accounting matters through to the Accounts Department as well.

Another important administrative area which the Extension Studies Department has had to deal with is student records. Until 1986, most records were simply kept in a filing cabinet in the Department. Little effort had been made to take advantage of the University's computerised system, which reflects the state of the Department's own lack of organisation at that time. With the appointment of an Assistant Registrar things began to improve. A major project was begun to verify and computerise all past results, to the extent that such was possible given the considerable disarray in which they had been kept. A new registration form was designed and put into use, which better suited Extension Studies and at the same time meshed with the requirements of the Computer Centre. The Department now is able to get the printouts it requires to accurately record student information and students themselves receive a computer printed notification of their results each semester something which did not happen in the past.

The increased use of the University's Computer Centre has improved the Department's overall operation significantly, but it has brought other problems as well. The Extension Studies Department now enrols over two thousand students each semester - more than the total registrations for the two campuses in Port Moresby (Waigani and Taurama) — and the number is increasing. One of the reasons that Extension Studies begins its two semesters three weeks earlier than on campus is to avoid overburdening the Computer Centre. However, for countless reasons which are endemic to the running of an extremely decentralised distance teaching operation, Extension Studies registration forms or final results often do not arrive at the Computer Centre on schedule. On-campus activities then take priority and further delays occur. One solution would be to set up a separate computer data base, but given the Department's limited staff resources, this is not possible at the moment. It is something, however, which should be considered for the future.

Another major problem for the Department in recent years has been delays in the printing of course materials. Such delays can disrupt students very seriously, as when materials are not available to enable them to complete courses they have begun. This then puts an extra burden on course coordinators who must deal with the telephone calls and letters from anxious students and tutors. Without doubt, the increased demand placed by Extension Studies on the University Printery has necessitated some reorganisation and changes in procedure on their part. However, the problem lies with the management itself, which is weak despite the good technical capability of both equipment and staffing. As a result, the Department is now having to look at alternatives perhaps its own printery or raising student fees to cover outside printing costs.

Staffing Issues

The Extension Studies Department has three categories of staff: academic, administrative and clerical. The academic staff include course coordinators based at the main campus and Directors of University Centres in the provinces. At present, only the campus Department has administrative staff, though as centres grow and develop, additional administrative support may be required there as well. Both the campus Department and University Centres have clerical staff.

At present the Department has course coordinators in language, science, social science, mathematics and education. They have full responsibility for developing and running the University's Adult Matriculation program and assist teaching departments to externalise courses at degree and diploma level as already discussed. Most teaching staff from other departments in the University do not have experience in developing distance teaching materials and thus would depend on Extension Studies staff for guidance and editorial assistance. However, except for the Education Studies Coordinator, most course coordinators do not at present spend a great deal of time working with other University staff members because of the limited number of courses under development by teaching departments at UPNG. A coordinator of course development is responsible for final editing and preparation of materials for printing.

The recruitment of course coordinators has become a problem, since the Department requires at least a Masters degree in the specific academic area and, ideally, experience in writing distance teaching materials. Applications for positions are almost never received from people with experience in distance education and as a result, work in the field of course or curriculum development and proven writing ability are usually accepted as sufficient. New appointees, therefore, must learn new skills on the job.

A major problem faced by course coordinators is the amount of administrative work they are forced to assume in running courses under their direction especially those in the Adult Matriculation program with very large enrolments. They are responsible for setting assignments and examinations, coordinating tutors throughout the country, dealing with individual student queries and marking final examinations. When problems then occur over which Extension Studies has no control, for example printing delays, the job of the course coordinator becomes even more frustrating. Course coordinators are recruited by the University as academic specialists in their particular fields of study. Due to this heavy administrative burden they carry, however, they find little time to spend on the academic side of their work in course development or research. Of immediate concern is the fact that the Department has no established course coordinator positions in those areas in which new programs are being developed, commerce and industrial relations nor in law, which has been running courses for years and is considering expanding its offerings.

To alleviate the situation, the Department has submitted several proposals to the University Planning Committee requesting additional staff positions. In particular, the Department has requested three full-time tutor positions with the specific role of running the very large Adult and Pre-Matriculation courses. It is significant to note that when the full-time Preliminary Year was abolished in 1986, most positions were cut as a cost-savings move. However, a number were simply absorbed into various departments within the University, but none went to Extension Studies, which had the task of carrying on the program. While the Department was able to cope at that time, the University Planning Committee has not supported the Department's recent requests for additional support. If some relief is not forthcoming, the Department will not be able to respond to the new developments at the diploma/degree level.

Moreover, the situation is making it difficult to retain qualified academics who see their careers jeopordised by the fact that they no longer have adequate time to devote to their own subject areas or, indeed, to even do the academic work associated with the job for which they were hired. Unlike normal teaching departments, Extension Studies does not have the normal breaks at the end of the year, which most University staff utilise for their own work. The Department is committed up to the Christmas break to running the Lahara session and then begins almost immediately thereafter with registration for the new semester which begins the third week in January.

Related to this is the difficulty the Department is having in attracting and holding qualified Papua New Guinean academics as teaching fellows. The University has a program whereby honours graduates are recruited to understudy expatriate academics with the aim of eventually localising the positions. They usually spend one or two years in departments prior to going overseas for further study. With the emphasis on high quality writing skills, it has been difficult for the Department to attract qualified people, whether National or expatriate. Of the five teaching fellows selected by Extension Studies over the past few years, three have left — two because the Department did not offer the desired academic career path and the other because of a lack of confidence in writing skills.

Indeed, it is not surprising that Extension Studies is having this difficulty given the fact that it did not exist as a Department until 1980. However, of greatest significance is Extension Studies' lack of status within the University as a whole and the related perception by quality Papua New Guinean academics that their opportunities are greater in the University's mainline teaching departments. Extension Studies is seen by most honours students as a second choice, as evidenced by the departure of two of the Department's teaching fellows when better offers came their way. If working conditions for course coordinators are not improved to enable them to be the academics they in fact are, it is most likely that attracting qualified Papua New Guineans academics into the Department and holding them will remain a problem.

The staffing issue is the most frustrating for members of the Extension Studies Department because it cannot be resolved through any particular individual effort, but depends on decisions made by University committees on which the Department may not even be represented or is only one voice among many — the Director of Extension Studies was made a member of the University Planning Committee in 1987. The issue as it was in 1977 is reallocation of resources. Given the current financial crisis facing the Papua New Guinea Government today, there is little chance of an increase in the University's annual grant, which means that any changes in programs or new developments at UPNG must come from within existing resources. As already noted, it has been possible recently to negotiate aid funded agreements between UPNG and two Australian Universities to provide assistance in the writing of new extension courses. In the long run, however, these new courses will need to be taught, which requires a commitment in terms of teaching resources by the departments involved, and the Extension Studies Department will need support staff to ensure proper coordination. These resources must come from within the University. The University community as a whole must take on the responsibility of providing both the Extension Studies Department and those other departments involved in extension teaching with the staff positions required to carry out this aspect of the University's work which it has severely neglected for years.

A recent positive development has been the favourable response to a proposal put forth by the Department to the University Planning Committee for the separation of the Extension Studies Department from the Education Faculty and the creation of a separate unit within the University equivalent to that of a faculty. Such a move is the obvious next step, given the significant growth of Extension Studies over the past few years. Moreover, since the majority of the Department's developed and proposed courses are in other faculties, remaining part of the Education Faculty has become an anomaly. Because of the special nature of the Extension Studies Department — a single department made up of individual academics from a range of different disciplines, incorporating significant administrative tasks and staff, with links to a majority of the country's provinces — it was thought by the Department that another form of unit to that of a faculty would be more appropriate. The proposal, therefore, is for the establishment of an Institute of Distance and Continuing Education with faculty status, which would allow for the special nature of the Department's internal structure, and at the same time ensure its representation within the University power structure by guaranteeing membership on key committees.

While the creation of an Institute of Distance and Continuing Education would, indeed, help to give Extension Studies the recognition it deserves within the University, the issue of resource allocation would remain. One of the reasons this has become such a difficult problem is that it stands at the heart of the much bigger issue which UPNG since its inception has continually debated, but never quite resolved — the question of identity. There are those who would argue that the University of Papua New Guinea should play the more traditional role within the community of providing a centre of academic excellence to which the best go to be educated as the country's elite and where scholars have the time to devote to pure research. While no-one can argue against maintaining the highest possible academic standards in both teaching and research, there is little doubt that the University also has the obligation to ensure that at least some of its resources are directed towards assisting Papua New Guinea to deal with its problems and achieve national goals. Teaching programs tailored for specific professional groups and applied research are ways in which the University is already fulfilling this obligation.

Clearly, another way is to support more vigorously its distance education program, which can help to overcome the problem revealed in the statistics presented at the beginning of this paper — the serious shortfall in qualified young people eligible to enter tertiary studies. To do this, the University must be prepared to look seriously at those areas of inefficiency — departments with low staff-student ratios and very few students doing major programs — and shift resources as required to support the development and teaching of distance education programs.

What is needed is for the University Planning Committee to institute a mechanism which regularly places before it information on all programs run by the University which can be used to assess whether a reallocation of resources is required. At present, as long as there are no major changes in the job description, most positions when they become vacant are advertised automatically and renewals of contract go directly to Staffing Committee with no formal consideration by Planning Committee as to whether the positions are still required. If all advertisements for vacant positions and renewals of contract were to go to the University Planning Committee first for consideration, valid planning could take place. In most cases, the original submissions would be approved. The positive result of such a change in the procedure would be that the University Planning Committee would automatically have the opportunity to make an evaluation of the use of the University's staff resources, something it does not do at present, and Extension Studies and those other departments requiring extra resources for distance teaching would have the chance to compete.

Conclusion

Despite some positive developments — the creation of a Department and the establishment of several University Centres — up to the mid-1980s, Extension Studies played a relatively insignificant role within the University in terms of student numbers and course offerings. Although there continued to be supporters within the University community as a whole, Extension Studies was perceived generally as a low status activity. Indeed, enrolments were so low that there was clear reason to simply abolish the Department. Nevertheless, it would appear that at least some people at UPNG were of the opinion that Extension Studies should continue, since a new Director was recruited in 1985, though it is evident that little consideration was given at that time as to how, in what direction or with what resources the Department should develop.

The strategy followed for the past six years to strengthen distance education at UPNG has been to demonstrate the potential of Extension Studies by improving the use of existing resources and building in those areas over which the Department had direct control. The result has been increased enrolments, improved course offerings and administrative systems and the expansion of the network of University Centres. At first, this could be achieved by making more efficient use of existing resources, but demand quickly outstripped the Department's ability to deliver required services with the result that staff are at present working under extremely stressful conditions. The dilemma now is whether to limit growth and let the Department settle back into the ineffectual role it played for so many years or to provide the needed resources to enable it to develop into the truly community-serving, cost-effective operation which it has the potential to become.

The efforts of the Department over the past few years have clearly been a success. Mushrooming enrolments have demonstrated the demand which has always been obvious. Political support at the provincial level has grown — backed in each case with substantial financial contributions — as evidenced by the increasing number of University Centres now in operation. The quality of the Department's revised Adult Matriculation courses has been recognised and there is strong support from the National Department of Education for the expanded use by its staff of the University's external Diploma and In-Service B.Ed. programs. Both private and government institutions have responded favourably to the University's efforts to provide programs through distance education in the areas of language, commerce and industrial relations. Indeed, the Prime Minister has publicly endorsed plans to increase support for distance education:

> Mr. Namaliu added that the plan [National Plan for Higher Education] would provide also for the increase of institutional autonomy, a greater level of responsiveness by colleges to local needs, increased private involvement, and a

> substantial and nationwide increase in extension studies activities.[Post-Courier 2 August 1990].

Moreover, there are indications that a proposal submitted to government for aid funds to construct a new building on the Waigani Campus for the Extension Studies Department has been received favourably. The University itself has already benefited from the expansion of Extension Studies over the last few years by being able to show an improved unit cost ratio. And it can expect to gain significant kudos in terms of its contribution to national training goals as the effects of the growth extension studies enrolments over the past few years come to fruition.

Extension Studies would not have survived all these years had it not had the support of a number of academics and administrators from throughout the University. However, this intellectual commitment to distance education was never matched with the hard decisions by the University community as a whole that were required to effectively establish outreach as part of the ethos of the University of Papua New Guinea.

It would be unfortunate for UPNG to miss the opportunity it has at this point in time to finally achieve this goal which the early planners envisaged as a vital function of the new University. For this to happen, the University must honestly review the effectiveness and value of its courses and programs in terms of national priorities and make the necessary reallocation of resources required to allow the Extension Studies Department to consolidate its achievements and to assist other departments throughout the University to continue the development of distance education as a means of instruction. The need has always been there, but what makes 1990 different is that an increasing number of teaching staff are now interested in making their courses available through distance learning and the University now has a true distance education unit with structures and programs which have proved their effectiveness.

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DISTANCE EDUCATION AND THE PROFESSIONAL DEVELOPMENT OF TEACHERS IN PAPUA NEW GUINEA

Michael Crossley

Introduction

Since Papua New Guinea gained Independence in 1975 the growth and development of the national education system has been rapid in nature and dramatic in scope and substance. At independence there were 1,762 community schools, 78 provincial high schools and two national high schools within the system (PNG, NDOE 1985). In 1988 these figures were 2,503; 123 and four respectively (PNG, NDOE 1989). The present government anticipates further growth in all sub-sectors and, giving priority to primary education, has targeted 1999 as the date for universal primary education. Expansion of the national high school sub-sector is also given some priority as the necessary foundation for improved quality at the tertiary level and for the production of essential high-level manpower. Perhaps somewhat ironically, social demand is strongest for increased provincial high school places largely because primary qualifications are no longer sufficient in themselves to secure modern sector employment.

The implications of this expansion for teacher education and training are significant. In quantitative terms more teachers are urgently required, especially at the secondary level where posts already remain vacant. Qualitatively speaking a succession of recent consultative reports have called for improvements at both the primary (see McNamara 1987) and secondary (see Jordon 1987) levels of teacher education in which the extension of preservice programmes from two to three years in duration feature prominently. Indeed, Goroka Teachers' College (the only secondary teachers' college in the country) introduced a new three year diploma programme in 1988 and the first cohort of graduates from this were produced in 1990. In short, quantitative expansion combined with the qualitative upgrading of practising teachers is a major problem for a rapidly expanding system in which many staff face rapid promotion in the absence of adequate preparation or experience.

International Experience

It is in this context that the paper considers the potential of distance education for the professional development of teachers in Papua New Guinea. To some present observers the country may appear to have been slow in moving in this direction given the international enthusiasm for distance education in recent years - and the relatively successful experience of teacher education through the distance mode of study (Daniel et al. 1982; Holmberg 1981).

Early enrolments to the British Open University established in 1969, for example, were dominated by teachers pursuing full degrees (Perry 1976); while today the emphasis of the School of Education is on the production of specialist inservice courses and activities for practising teachers. In Australia the University of New England experienced similar demand with school teachers constituting over 80 percent of total enrolments during its first decade of operation (Evans and Nation 1989:238).

In developing countries interest in distance education for teachers has been further enhanced by its perceived cost-effectiveness - a factor that proves particularly attractive where funds and trained staff are in short supply (Guthrie 1985). Taylor (1983), for example, reports the findings of a study of two inservice distance education programmes for upgrading primary teachers in Africa. The Bophuthatswana Teacher Upgrading Project (BTUP) which operated from 1973 to 1977 emphasised academic courses leading to general secondary-level certificates whilst the Lesotho In-Service Education for Teachers (LIET) project consists of both academic and professional courses for primary teachers. Taylor's evaluation provides evidence of successful upgrading in both cases in a cost-effective manner. References to the achievement of similar initiatives in less developed countries are not hard to find and, following a review of the international literature, Perraton concluded that:

> ...distance education for teacher training has a record of success in Africa which is important both in planning further inservice training and as a demonstration of the potential contribution which similar methods can make for other types of education (1986:10).

The literature is, however, replete with warnings that while cost-effectiveness is a major consideration the realistic costs of distance education should not be underestimated if programmes are to prove effective and worthwhile in practice. We will return to issues of adequate funding and support for distance education later in the discussion.

For present purposes it is perhaps even more appropriate to consider experience elsewhere within the South Pacific. This is again encouraging because the Department of Education at the University of the South Pacific (USP) has played a leading role in the impressive growth of distance education serving the Pacific Islands. Teacher education was a major priority for USP from its inception as a regional university in 1968, and until 1984 students enrolled in teacher education programmes constituted the majority of the student body (USP 1987). The Department of Education was the largest university department, and was responsible primarily for a range of preservice certificate, diploma and degree programmes in education (Thaman 1989).

By 1983 when an influential 'Conference on Future Directions' for the University was held, the demand for qualified teachers had begun to decline as preservice needs were either met or different nation-states of the Pacific began to conduct their own teacher education programmes through newly established national institutions for higher education (Crossley 1989a). In view of these changes the Department of Education at USP shifted its own priorities to focus increasingly upon inservice education for teachers and the application of distance education methods to reach new clients. New programmes and courses were introduced including an Inservice B.Ed. Degree, a Certificate in the Teaching of English as a Second Language and a Diploma in Educational Administration. Many courses comprising these programmes can now be taken by extension and the total number of external students in Education exceeds those pursuing full-time study. In Semester 2 of 1986, for example, over 800 teachers from the region were taking Education courses externally (USP 1987).

On the other hand, as Davis and Naidu (1989) point out, the growth of external studies at USP was also facilitated by the regional character of the University as 'member' nations looked for ways of extending the services of the Fiji-based campus to the more isolated island communities. Governmental pressure from the smaller Pacific states, for example, stimulated the development of university centres throughout the islands - and 10 centres now form a crucial component of the USP distance education network. Although, as is noted later, the development of distance education at USP has not been without its own problems, there is much that Papua New Guinea can learn from this and other experience without falling prey to the dangers of uncritical international transfer. International experience such as this can be both encouraging and cautionary, but, if it is to prove helpful for Papua New Guinea it must be carefully interpreted with reference to the nature of teacher education in the national context.

Distance Education at the University of Papua New Guinea

The University of Papua New Guinea (UPNG) was founded at Waigani in Port Moresby in 1966 following the recommendations of various consultancy reports that emphasised the importance of both teacher education and university outreach for the new institution. For example, in recommending the establishment of a Department of Extension Studies the Currie Commission (1964) argued that:

> ...if suitable potential students cannot go to the University, then the University must go to them (Currie et al.: 243-244).

Reflecting more traditional academic priorities held by those charged with implementing the university concept it was not until 1971 that Lahara (Summer School) courses were first introduced for those (especially school teachers) unable to undertake full-time study throughout the normal academic year. Even so Lahara teaching remained residential and face-to-face in nature and it was not until 1976 that external degree-level courses were made available to small numbers of students for the first time. In 1977 the first Director of Extension Studies was appointed, although reflecting upon the staffing and resource situation he lamented that 'no more than token support existed' (Healey 1978:12). Furthermore, the new department was given little scope for direct influence upon the University by being restricted in size and located within the broader administrative structures of the Faculty of Education.

In practice Extension Studies struggled for survival with minimal staffing and low enrolments until the mid-1980s. A very limited range of courses was offered with greatest emphasis being placed upon matriculation-level study. Matriculation courses were solely the responsibility of Extension Studies personnel, whereas diploma and degree courses were intended to be externalized by members of the relevant academic departments with the support of extension staff. Few such courses were produced at the time because of what has been called a combination of academic conservatism, competition for resources and political sensitivity (Griffin 1984:327). Significantly no external programmes or courses for the professional development of teachers were offered through Extension Studies by the Department of Education - the only other teaching department in the host Faculty for Extension Studies. The Department of Education did, however, launch its own distance education Diploma in Educational Studies (DES) for education personnel which has achieved considerable success in its own right, and from which there are valuable lessons to learn.

The Diploma in Educational Studies (DES) Model

The strengths and limitations of the DES model have been discussed in detail elsewhere (Crossley et al. 1985; Smith et al. 1984) but in the present context it is useful to draw attention to the distance aspects of the model's structural components.

The DES is a two year sub-graduate diploma for serving teachers and administrators. Programmes have been mounted since 1973 in specialist areas for primary school staff, teachers' college lecturers, educational planners, adult educators and school-based curriculum developers.

A flexible structure allows the introduction of new specializations as the need arises within the education system. For example, during the early 1980s the World Bank funded Education II project was established to support the quantitative and qualitative improvement of the primary sector of education (PNGJE 1984). As part of this initiative, funds were made available for the establishment of a new DES (Planning) at UPNG to train a cadre of educational planners for work in the provinces and central National Department of Education (NDOE). This was seen as an essential strategy for improving the capacity of the newly decentralized education system to implement and build upon the various sub-projects of Education II and any subsequent development projects (Bray 1984). From the outset it was envisaged that when a supply of trained educational planners was produced the DES (Planning) option would be withdrawn - along with the associated World Bank funding which covered staff salaries and other expenses. This was in fact the case, although the success of the planning sub-project remains in question.

The flexible DES structure has served both UPNG and the NDOE well over the years because each programme combines two years of on-the-job training with two, six-week Lahara residentials, professional field support for each student by visiting lecturers, and regular correspondence assignments that are tailor-made to fit the requirements of the professional task in hand. Educational planners could, for example, study the principles of educational planning during their residentials, work upon a provincial plan back on the job, receive professional support from their lecturer during regular visits to the province, and submit draft plans for comments and assessment as assignments. Ideally, similar packages would be available for school-based curriculum developers or other DES specialisms.

Many innovative and educationally sound principles can be seen to be at work here in addition to a vigorous effort to implement the outreach and work-study concepts embodied in the Currie Report and, perhaps more notably, in the perceptive but often overlooked *Report of the Committee of Enquiry into University Development* (Gris 1974). The DES programmes have clearly established a valuable fund of distance education experience within the Faculty of Education which should be of use in the future. The model, it should be recognized, is not solely academic in nature, which helps to explain why numbers are relatively small and travel costs for supervisors can be high. The field visits and residential summer schools provide face-to-face support in what is, in overall structure, a strong distance education model for the professional development of educational personnel.

The future of the DES model at UPNG will depend in large part upon the demand for specialist training from the NDOE and upon the priorities of the Department of Education itself. Currently only the DES (Primary) continues in operation and this is being transferred to the Port Moresby Inservice College, (with approximately 70 students enrolled) although a new DES (Teacher-Librarianship) course is planned for introduction by the Department of Library and Information Studies in 1990.

Changing Priorities in Teacher Education

Teacher education in Papua New Guinea is focused upon eight primary teachers' colleges dispersed throughout the 19 provinces; one primary teachers' inservice college located in Port Moresby; Goroka Teachers' College (a constituent part of UPNG) which offers education and training for the secondary sector; and the Faculty of Education located at the Waigani Campus of UPNG, which offers a variety of preservice and inservice programmes for primary and secondary teachers.

Changes envisaged for teacher education at both the primary and secondary levels, combined with moves to rationalise higher education nationwide, are today influencing future directions for UPNG and for the Faculty of Education in particular. Documentation of these trends deserves consideration in its own right but draft plans already endorsed for 1990-1994 indicate a shift of emphasis for education programmes at UPNG Waigani that has implications for distance education. In brief, the intention is for teacher education at Waigani to focus increasingly upon in-service work at the graduate and post-graduate levels while concentrating sub-graduate and pre-service teacher education on other relevant institutions. Although this points to a movement away from the DES at the Waigani campus, the Department of Education has, at the same time, formalised new commitment for increased involvement in the externalisation of education courses in collaboration with the Department of Extension Studies (UPNG, Faculty of Education 1987).

In this broader context of teacher education and higher education planning it appears that it may now be possible and appropriate for the Department of Education to redirect some resources from DES or other initiatives to support the development of degree and diploma courses for practising teachers which will be made available through a sound combination of internal and external modes of study.

Distance Education for Teachers at UPNG

In view of the above developments and the demand for more and better qualified teachers throughout Papua New Guinea, the potential for distance education to make a contribution to teacher education - especially at the inservice level - is now most significant.

The resurgence of the Department of Extension Studies since the mid-1980s also helps to make the realisation of this potential through UPNG more realistic. The Department has made major improvements in administration, student support and course development in recent years, greatly strengthening its capacity to serve students dispersed throughout the country. General course registrations have increased from 855 in 1985 to over 4,000 in 1989 and the number of University Centres located in the provinces has grown from three to eight over the same period (UPNG, Department of Extension Studies 1989). Many of the external students currently enrolled are practising teachers, although it is only since the start of 1989 that specific teacher education programmes and courses in education studies have been launched in this manner.

While staffing and resource limitations continue to plague Extension Studies, a position has been created within the Department to lead and coordinate teacher education initiatives, and progress on three separate programmes has been made. These are: the B.Ed. Inservice Degree; the Diploma in Teaching (Primary); and the Certificate in Non-Formal Education.

Developments in the first two of the above programmes exemplify the potential of distance education for school teachers very well, while the scope and nature of the non-formal initiative make it less relevant for the present discussion. Before going further it is perhaps helpful to first outline the nature and structure of the B.Ed. Inservice and Diploma in Teaching (Primary).

Currently the B.Ed. Inservice Degree is a two year full-time programme designed for qualified teachers with successful experience and the potential for academic advancement. Students, of which there are approximately 70 enrolled in each annual cohort, compete for government sponsorship on full pay, although only about 45 sponsored places are available each year. Admission is keenly contested and many potential candidates are disappointed not to receive a sponsorship award despite having passed the required English language entry test. Some of the very determined still enrol for the two years, and either sponsor themselves or apply for a student grant (Natschol) which covers only basic living expenses and fees.

Many enthusiastic teachers with university potential are thus denied access to further study by sponsorship and other enrolment constraints. As courses for the B.Ed. Degree are externalised these people will have an opportunity to begin study while remaining in their teaching posts. This will take some time because only two education courses are currently available, these being Foundation Studies in Education and Curriculum Development. Others are in the pipeline, however, and seven Faculty of Arts courses that can be credited to the B.Ed. are already available externally. The general objective is to work towards the externalisation of the first year of the Inservice B.Ed. in the first instance.

The development of the Diploma in Teaching (Primary) has moved hand in hand with the B.Ed. Inservice Degree as it is composed of a combination of existing external matriculation courses and a mixture of UPNG Foundation Year and B.Ed. options. This Diploma was newly introduced in 1989; it can only be taken externally, and is designed to upgrade community school teachers in subject content and professional skills - while acting as a bridging programme for the more able to reach the level required for entry to the B.Ed Degree.

Teachers holding only primary level qualifications must pass the Diploma before being eligible for external B.Ed. enrolment. This innovative diploma has already attracted the attention of large numbers of primary teachers and is seen as a useful means for professional upgrading by the NDOE Staff Development Unit. Initially those enrolled will be taking matriculation and Foundation Year courses but in time many will progress to the education course options that feature in the latter part of the programme.

Potential Advantages of External Study

In the context of contemporary Papua New Guinea, access to distance education programmes has many potential advantages for the professional development of practising teachers. Firstly, both external programmes already outlined facilitate the upgrading of knowledge, skills and professional qualifications without withdrawing teachers from the schools. This is especially important where teachers are in short supply. Secondly, distance study allows more teachers to participate in the B.Ed. Degree without the cost of increased sponsorship by the NDOE. Thirdly, if a mixture of external and internal candidature is encouraged for the Degree, external performance can be used to assist in the better selection of candidates for full-time sponsorship. Alternatively, students who find it difficult to complete the full two years of residence may find it helpful to finish their degree externally - and there are already numerous former students in this position, students who will now have a realistic opportunity to complete their studies for the first time.

Fourthly, with respect to female enrolments, which have traditionally remained few in number, external study offers access that may be more compatible with the demands of family life and community expectations. The difficulties of attending to family responsibilities and external study, remain problematic however, as researchers concerned with the education of women in Papua New Guinea have clearly shown (Wormald and Crossley 1988). Extension study does nevertheless help people to work at their own pace and this is often an appropriate way of building up the academic confidence of those who lack recent study experience.

Fifthly, in times of budgetary constraint, externalisation holds considerable potential for more cost-effective use of University manpower and resources. Good external materials can also be used to support internal teaching and, especially in departments where staff turnover is rapid, departing specialists can help improve continuity and leave a useful legacy of their work in the form of external course materials.

Finally, in considering potential benefits we should return to the basic issue of access again, because increased access to study opportunities at home dramatically facilitates the expansion and democratisation of educational opportunities. This is a signgificant issue in its own right in countries such as Papua New Guinea in which only a very small proportion of the population receive a university level education (Crocombe and Meleisea 1988).

Clearly the potential of distance education to play an increased role in the professional development of teachers in Papua New Guinea is considerable. The need is great, the demand exists, and the structures and programmes to make it possible are now beginning to emerge.

It is to an appraisal of the difficulties and limitations that must be faced that we now turn before concluding with a consideration of future avenues for development.

Difficulties and Limitations

In the terminology of distance educators, UPNG is a 'dual-mode' institution in the Australian pattern where internal and external teaching are carried out by the same academic staff with the support of a Department of Extension Studies. The troubled history of external teaching at UPNG, the slow start and lack of widespread active involvement, point to difficulties inherent in the dual model, especially where commitment to the external dimension is not well established. Where external teaching is added to internal responsibilities at a later point in time - as was the case at UPNG - the potential for problems is intensified.

Many difficulties now being faced by the Department of Extension Studies at UPNG have arisen in this way and, in turn, these internal University problems have implications for the development of external teacher education. If, for example, education courses of acceptable quality are to be developed and taught in the external mode, sufficient time and resources must be reallocated within the University's Department of Education. At the psychological level staff must come to see external activities as a regular and legitimate dimension of their workload and the Department itself must incorporate external courses into its standard offerings each semester. This is foreshadowed in the Department of Education Plan 1990-1994, but the detailed implications of external commitments have yet to be encountered in practice. The production of external courses requires considerable lead time for writing, revision and publication. Materials must be written at a level appropriate for the students, and set readings must be carefully chosen for their readability. Lockwood et al.'s (1988) research at the USP underlines the importance of such factors, noting that in only one out of six external courses evaluated did students perform at the reading level required by the materials produced. Realism in course development is particularly important in contexts (common throughout the Pacific) where external students study in a second or third language and live in very isolated locations.

Similarly, external teaching requires rapid and regular feedback to students via written or verbal comments from the lecturer or tutor in charge, if drop-out rates are not to be high. Effective feedback depends upon the number of assignments required each semester, the turnaround time for marked work, the quality of tutors' comments and the effectiveness of administrative and distribution systems (Prasad 1988). Research conducted at USP (Roberts 1987) suggests that external courses benefit from between four and six assignments per semester and a turn around time of one week for assignments (excluding postage time). The experience at both USP and UPNG in this respect has been far from ideal, with major problems and delays being encountered with some Foundation Year courses at UPNG when staff new to the demands of distance teaching have given little priority to their external responsibilities. To some extent this problem is one of commitment and lack of experience, but the realities of practice also point again to the need for adequate staffing and resources if external study is not to be relegated to a second-class option.

Budgetary limitations upon the University obviously restrict what is possible at the broadest level - as the Department of Extension Studies is keenly aware - but some reallocation of resources within teaching departments is possible and this can make a significant difference to the extent and quality of external studies conducted. This, as already noted, is essential if success is to be achieved in external teacher education courses.

In the long run it is the achievements of students in their studies that demonstrate the effectiveness of distance education. To date there have been few detailed evaluations of attrition rates in external courses at UPNG, with the exception of mathematics (Kaeley 1989; Kember 1981). Moreover, with external teacher education programmes being so new (excluding the DES model) there are few data available for analysis in this respect. The first education course (Curriculum Development) to be taught externally, however, did achieve a pass rate of 73 percent in Semester I 1989. This is an encouraging start but it should be acknowledged that course materials were carefully developed well in advance of teaching, that all participants received rapid and detailed written feedback on their assignments and that, for most students, university centre support and encouragement was made available. In addition this course benefited from being built upon the foundations, materials and experience of the former DES (School-Based Curriculum). This was a programme that had proved successful in the field but one that was usefully integrated with the B.Ed. Degree as the pilot project it was originally designed to support changed its own scope and structure.

On the other hand, evidence from the field where teachers have taken external courses, from the DES programmes (Smith et al. 1984), and from the Advanced Diploma Unit (ADU) at Goroka Teachers' College (UPNG, ADU 1988) does point to certain difficulties experienced by practising teachers that deserve some attention. For example, without going into detail about the distinctive problems faced by the ADU, the experience of this school-based teacher upgrading programme suggests that staff do have difficulty in finding sufficient time to complete correspondence assignments while on duty in secondary schools; and that headmasters, inspectors and NDOE authorities voice concern if they fear competition developing between the demands of school duties and external study (UPNG, ADU 1988). The teachers' role, notably in the 'total institution' of boarding schools which characterise the provincial high school system, is clearly very time consuming and this places limitations upon what can be realistically achieved by external study. Recent efforts to remodel the Advanced Diploma in Teaching acknowledge that if distance education is to continue to feature in this program greater attention must be paid to interactive materials development, to field support and to assessment feedback; if disappointing completion rates for external assignments are not to be repeated in the future (UPNG, ADU 1989). Also, where external courses can demonstrate direct relevance to job performance the concerns of headteachers and NDOE authorities can be reduced.

In closing this section it is helpful to draw attention to the more general limitations of distance education because, despite its undoubted potential, it is not a panacea for teacher education as some enthusiasts suggest. Neither is it helpful to treat it as a second-class option or always as a cheap alternative to orthodox study. Distance education cannot do everything equally as well as face-to-face teaching, nor should it be seen as necessarily operating alone. Some subjects, such as scientific and professional courses that benefit from practical activity and supervision, are harder - though not always impossible - to externalise; other courses fit the external mode very well. Improved cost-effectiveness can result from distance education but this usually necessitates large numbers of students (Guthrie 1985). Where large numbers are unlikely, such as in the context of small island states (Perraton 1987), this may not be possible, but the improved access to study opportunities may itself justify effort and expenditure.

Future Avenues for Development

In Papua New Guinea, where schools are widely dispersed in the often difficult terrain of the highlands and islands, distance education can play an important part in the professional development of teachers. It can help to open access to University study for staff in remote and isolated schools, and it can help to strengthen the overall provision of teacher education - hopefully in a cost-effective manner.

For distance education to be worthwhile and successful it nevertheless requires adequate support and funding,not least because the development of quality materials requires considerable investment of the time and efforts of skilled personnel. Distance education is not an easy option for its teachers, administrators or learners. Plans for the creation of a purpose designed Extension Studies complex (UPNG, Department of Extension Studies 1989) to be built at UPNG should, in this light, be given priority attention as funds for development become available, if the University is to demonstrate serious commitment to the outreach dimension of its role.

To date, priority at UPNG has been given to the pragmatic, organisational and administrative aspects of developing a distance education network and to the quantitative expansion of programmes on offer. With reference to teacher education the emphasis has been upon the formulation and establishment of new external programmes, and more recently upon the production and teaching of prototype course materials (Crossley 1989b). The fact that such activities have dominated this phase of development is to be expected, but as programmes become institutionalised new priorities for development will rightly come to the fore.

We have already pointed to the potential benefits of viewing external courses as one dimension of teacher education, and of recognising how credit for University qualifications can be obtained from a mixture of internal and external study. Distance education can avoid a second-class image more easily if it becomes part of a broad approach to teacher education, as opposed to a separate and 'alternative' mode of study (Brophy and Dudley 1982).

Collaboration with other institutions offers further exciting lines of development for the future because external courses need not always originate from the home institution. Within the Pacific, as we have already shown, the USP has been a leader in external teacher education, and the potential for UPNG to adopt or adapt relevant USP courses for its own creditation is significant. Conversely, some UPNG courses may be relevant for USP. Joint course development work has already been carried out in the discipline of language teaching with the support of the Pacific Languages Unit of USP located in Vanuatu. The use of new technologies such as satellite transmission and computer assisted learning opens further doors for international collaboration in distance education - collaboration that may allow Pacific universities to benefit more directly from the resources of Pacific rim nations such as Australia and Japan (Crocombe 1988). Such possibilities will become even more feasible with the development of the Commonwealth of Learning initiative designed to foster the sharing of courses, expertise and ideas worldwide.

Finally, with such cross-fertilisation of ideas, attention to the qualitative dimension of distance education should gain increased attention. This in itself has many dimensions ranging from simple efforts to improve retention rates to more critical investigations of the notion of quality in distance learning. At the heart of such work must be a genuine concern for research and evaluation - to cite Perraton, 'the role of research and evaluation is crucial to the growth and proper use of distance teaching methods' (1987:84).

In Papua New Guinea, the distinctive cultural and learning problems of second language students have hardly been explored in the context of distance education. Few systematic course evaluations have been conducted, but qualitative improvements to courses are required and attrition rates must be reduced, because access to education is of little benefit if success is elusive to many of those enrolled. Perhaps even more pertinent for teacher educators is the national demand for the 'reflective teacher' who is trained in aspects of pedagogy but also well enough educated to be critically aware:

> ...who as an independent professional will be capable of designing a suitable learning and teaching environment, able to participate effectively in community development and who will treat the child as an individual rather than as an object for instruction (McNamara 1989:6).

In this context external teacher education must provide more than content knowledge and basic training, but as Evans and Nation point out, few external courses worldwide as yet:

> ...engage people in shaping their own learning experiences and which also involve the practitioners in probing, questioning and debating their work in the pursuit of improvement (1989:9).

Research and development in distance education in Papua New Guinea cannot ignore such fundamental issues if the whole exercise is not to become dominated by a technocratic notion of efficiency that eschews self-directed, interactive and reflective learning for the students and becomes, in Evans and Nation's terminology, 'bureaucratic and dehumanising' for all involved (1989:252).

The process of distance education tends towards an industrial-technocratic mode of operation with the division of labour and of learning into digestible units of work. Within such a framework, especially where pressures upon time and resources are great, care must be taken in external course development to recognise and foster those qualities of learning that distinguish university education from training, uncritical knowledge retention and simple skills learning. Criticism, for example, of behavioural objectives and rational curriculum planning (Lawton 1983) that has challenged the technocratic approach to education, curriculum development and course design, deserves special attention from distance educators. Objective-based notions of efficiency and effectiveness may have their part to play in teacher education and training, but they also have their limitations.

Similarly, if distance educators are to make a distinctive academic contribution to educational research and development a critical concern for the external learning process must be encouraged. This must be supported by equal access for staff to those resources, facilities and opportunities that make university enquiry possible. This is one issue that attracts considerable concern from distance educators but one that deserves more concerted attention in the practice of distance education worldwide. It is from such work that many qualitative improvements to distance education will arise.

For teacher education in Papua New Guinea, where efforts are being made to develop professionals who can contribute meaningfully to the processes of social and educational change, it is as necessary for distance education initiatives to embody critical reflection and reflective teaching as much as it is for internal courses offered through the nation's teachers' colleges and universities. This is a big challenge, because while the more pragmatic concerns of distance education will continue to dominate attention for some time to come, the response to qualitative issues such as these will in large part determine the respect and value accorded to distance education programmes and to those, both staff and students, who participate in them.

For external teacher education in Papua New Guinea there is a long way to go; but the demand is considerable, the need is great and significant developments have at least begun.

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PAST AND FUTURE DISTANCE EDUCATION MODELS OF THE ADVANCED DIPLOMA IN TEACHING - GOROKA TEACHERS' COLLEGE

Norma Simpson

In October 1989, a multidisciplinary committee completed the third in a series of workshops to change policies and to begin to restructure the Advanced Diploma in Teaching (ADT) of Goroka Teachers' College (GTC). Major changes were proposed based on recommendations made during the two previous conferences when former students, headmasters, secondary inspectors, academics, administrators of the National Department of Education (NDOE) and Advanced Diploma Unit (ADU) staff expressed their concerns about the progress and problems of the ADT programme (ADU 1989a; Guy 1988a; Guy 1988b).

The purpose of this paper is to provide historical background about the Advanced Diploma in Teaching (ADT) and to compare the three models of the ADT-the traditional model, the experimental model, and the emerging model. The emerging model will be operationalised during the first six months of 1990.

Background to Courses at GTC

Until recently, most Papua New Guineans trained as provincial high school teachers received only two years of preservice training. For about 30 percent of the teachers, this meant two years education beyond Grade 12 in the national high schools. For the other 70 percent, it meant three years beyond Grade 10 of provincial high school (O'Hara 1989). This latter group in the past had a "Preliminary Year" (PY) at GTC which was limited to the two areas they chose to study. Approximately ten percent of the Papua New Guinean provincial high school teachers hold a four year degree. Those with a degree usually teach in the four national high schools.

Those teachers who graduated from GTC between 1968 and 1980 were trained to teach three subjects as well as studying the professional studies courses of educational methods, psychology, theory and undertaking teaching practice experience in the community schools and provincial high schools. The next group of students that graduated between 1981 and 1990, were trained for two years in two subjects plus the professional studies courses. The current groups to graduate, beginning in 1990, will have three years of training in two subjects plus a professional studies course. Core subjects taught are Language Studies, Mathematics, Science and Social Science. Non-core subjects include Agriculture, Commerce, Design and Technology (in schools referred to as Practical Skills), Expressive Arts, Home Economics and Physical Education.

At one time, a second group of students came to GTC from teaching primary grades in community schools and from technical and agricultural colleges. They received one year of training in their field plus teaching methods, language studies and specialisation in one additional subject of their choice (Peril 1988). At the present time only technical and agricultural students come for the extra year of study. Upgrading of community school teachers ceased in 1982. The policy of the national government has been to continue to upgrade teachers and to nationalise all the positions in the provincial high schools. One option for upgrading practising provincial high schools teachers is the Advanced Diploma in Teaching.

The Advanced Diploma in Teaching

In 1983, the ADT was devised by Goroka Teachers' College of the University of Papua New Guinea in cooperation with the National Department of Education. Funding was provided through the Education III Project from the World Bank. In 1984 international writers were contracted to design the curriculum and write materials for the core subject areas of English, Social Science, Science and Mathematics. The courses were to be of the calibre that Advanced Diploma students could receive degree credit from the University of Papua New Guinea towards a degree in education. In 1986, writers were sought for the non-core areas of Commerce, Home Economics and Agriculture. Writers of Design and Technology, and Expressive Arts are expected to be appointed in the near future.

The Traditional Model

Teachers eligible for the Advanced Diploma must have completed three years in the teaching force. They apply for training through their headmasters, secondary inspectors, and the assistant secretaries for education of the provinces. Approved applications are sent to the Staff Development Unit for the fourth stage of selection before applications are forwarded to the Goroka Teachers' College Selection Committee. Each year since the ADT programme started, about 50-60 new teachers have enrolled, 84 have graduated with the Advanced Diploma and 123 teachers are continuing in the programme including those who have deferred study for a variety of reasons. Fifty-five teachers have officially dropped out (Advanced Diploma Unit, January 1990).

Teachers register for one of the courses which they studied previously and are also teaching. There are teachers in the provincial high schools who are teaching subjects which they had never studied such as Commerce, Home Economics and Agriculture. Kwache (1989) made some proposals to provide a training programme for those teachers who are not eligible for the Advanced Diploma. The traditional model of the ADT is a two year programme which includes two six-week residential instruction periods each year with distance learning assignments between each residential period. The four residential periods amount to about 360 hours of face-to-face instruction. During the residential period, distance assignments are explained and materials provided for their completion. ADT students take out books from the library to take home with them. Also the ADT office has a message telephone system so that students can request assistance of all types even after office hours. When the ADT writers began to prepare the curriculum in Social Science, Mathematics, English and Science, they had very little experience in Papua New Guinea. Some had no experience in developing countries while others had extensive experience. Due to time constraints, they often had to begin designing the curriculum and writing the course materials before even minimal Papua New Guinea experience could be gained.

Generally speaking the course writers developed the courses in relative isolation from the departments which teach the preservice courses and from other ADU staff. This idiosyncratic method of course development lent itself to the borrowing of methods and levels of content which at times had little relevance to the Papua New Guinea context. Too little recognition was given to the social and cultural assumptions that the writers brought with them and to ways of 144 investigating the needs of the provincial high school teachers (Guy 1987b: 78-85). Too little was known of the level of proficiency of the teachers in their subjects and their reading skills. Diagnostic tests are not performed for English or Mathematics (Saveman Woksop Nius 1989). Nor are diagnostic tests for Science given to Home Economics teachers whose background is weak in this area.

There was disagreement about whether the Advanced Diploma should be geared towards the out-dated school syllabus, curriculum materials, and/or texts or to prepare the teachers to be active in upgrading and following a changing syllabus for the 1990s. Some courses were pitched at a level above the ability of the ADT students and their previous training. Others were pitched at a level below their ability (Guy 1987b:25-27). Much of this lack of planning and organisation was due to delays in recruitment and to time pressures to have the materials ready for the upcoming residential sessions and to complete course design within the writer's contracted period of eighteen months.

In retrospect it is now felt that course content has depended too heavily on the face-to-face instruction and too little on preparing the ADT components in a distance education format. There also was little time to trial the materials before they were used in the ADT programme.

These factors contribute to the higher drop-out and deferral rates which plague the Advanced Diploma, but they are not the only factors. Social factors related to family obligations and constraints play a more prominent role in deferrals. These constraints range from husbands hiding or burning course materials or making their spouse return in the middle of a residential; to tribal fights which may force a young man to return to his community to fight or threats of payback killings which unfortunately happened during the ADT residential session in 1988. (Guy 1987b: 49-50). Another factor related to deferrals is the system of staff transferring from one school to another in the Papua New Guinea system. Some schools may have more teachers enrolled in the ADT than they can possibly release at one time. For example, one school in Eastern Highlands Province had five of 20 teachers who were enrolled. There is no way that a school can have a quarter of its staff absent at one time for residentials, especially as substitute teachers are unavailable when teachers are absent. As a result, teachers defer their ADT studies.

The Experimental Model

When the author arrived at GTC in August 1987, no decision had been made about Home Economics curriculum needs for the ADT. At that time the Curriculum Unit of the National Department of Education did not have a senior Home Economics officer for provincial high school curriculum to offer suggestions. To establish the needs, previous documents on the preservice programme were consulted and weaknesses noted (Bacchus 1984; Humphrey 1984; Home Economics Department 1987; Home Economics Syllabus Advisory Committee 1987; Resek 1982. GTC Home Economics faculty and former faculty were consulted about the weaknesses of the teachers and of their preservice and inservice training programmes.

From these observations, the author prepared a tentative set of 26 cards for courses which might be taught in the ADT. Tentative course content was also included on the cards. The writer visited ten provincial high schools and three provincial department of education offices to interview in person thirteen Home Economics teachers, ten headmasters and deputy headmasters and three secondary inspectors from coastal and highlands provinces. Using a modified delphi technique, they were asked first to tell in which subject matter areas the Home Economics teachers were strong and in which they were weak. Cards were made for comments about weaknesses which were added to the cards previously prepared. The interviewees were asked to select the courses that should be included and those courses that should be dropped from the tentative curriculum. Finally, interviewees were asked to rank their preferences, and to add to or delete from, the topics listed as course content.

At the same time that the interviews were being conducted, a nationwide preference poll was being taken among Home Economics teachers in the 124 provincial high schools, headmasters and secondary inspectors. The poll asked the respondents to rank their preferences for eight courses to be included in the Advanced Diploma in Teaching Home Economics programme from the list of 26 titles. The return rate was 45 percent, representing 90 schools, with few responses arriving after the deadline of 1, December 1987. There was little difference between the responses of the teachers, headmasters and secondary inspectors, but there was some difference between the teachers in the highlands provinces and the coastal provinces. For more detail about preferences, consult Simpson (1988a).

At the same time that the preference poll was coming in, National Department of Education staff development officers decided to cancel the ADT Home Economics course due to an insufficient number of applications from Home Economics teachers. The ADT director and the writer were puzzled by the high rate of interest in the preference poll and yet few registrations for the course. After further analysis, it became evident that the following obstacles existed for the course.

1. Applications had been due in June, two months before the writer arrived in Papua New Guinea. Therefore no publicity or word-of-mouth promotion had been given to the Home Economics course.
2. Twelve weeks of the year is too long for female teachers to be away from their families, because most have small children.
3. Some husbands were not supportive of the study effort (Guy 1987b; Advanced Diploma Unit 1989).
4. Most women in Papua New Guinea nurse their babies for two years, a policy encouraged by the government. Government banned baby bottles in 1972, except by prescription, for women who do not have sufficient breast milk for their infants. As most of the teachers live on the high school campuses, it is convenient for babysitters to bring the child to the mother when it is time to nurse. But it becomes an expensive and inconvinient process to bring the babysitter and the infant to Goroka for the two six-week residential sessions.
5. No financial incentive is given to the teachers in any of the ADT courses which could off-set the cost of hiring people to care for any children for those 24 weeks. While male teachers could leave children in the care of their wives, the females would have to arrange for caretakers for their families, a very important financial consideration as high school teachers are not paid well. It is almost financially impossible for single women who are heads of households.

6. Because the traditional ADT model takes teachers out of the schools for the mid-year residentials, and schools can only spare a few teachers each year, some headmasters might tend to favour applications from teachers of core subjects. Only core subjects are tested in the national examinations. This might be detrimental to the selection of teachers in the non-core subjects such as Home Economics.

To overcome these obstacles and to attract female teachers, an alternative form of the Advanced Diploma in Teaching was needed. Therefore, in October 1987, the Advanced Diploma Unit began planning an experimental model that combined distance learning with residential instruction in the Advanced Diploma in Teaching Home Economics in a different fashion (Simpson 1987; 1988; 1989a; 1989b; 1989c; Guy 1988).

There are five outstanding differences between the experimental model and the traditional model:

1. The experimental courses are conducted on a regional basis. One advantage is the use of more locally relevant material and human resources that can be incorporated into the classroom.

2. The courses are conducted for one-week sessions, six times each year, and out of sequence with the traditional ADT residential sessions. That means that fewer teachers are out of the schools at the same time. This factor was favourable to the non-core subject of Home Economics during the first two years. It meant that the teachers could assign work for their students to complete during the teacher's week-long absence and then mark the work when they returned. No other teacher was assigned additional teaching responsibility.

3. To make up the difference in the number of weeks attended, the face-to-face component of the course is very intensive. No time is provided during the class hours for reading, writing or visiting the library. These activities are done at night or during the distance phase.

4. On-site visits are incorporated into the model as part of the face-to-face contact so the ADT faculty, or locally hired tutors, can see the teachers in their classrooms and assist them with problems that they have with the distance components and to incorporate the new knowledge into their teaching.

5. Inservice training assignments conducted in the high schools are an integral part of the courses. This has not worked as well as expected because inservice training is arranged by someone who is not concerned with the assignments and the new topics are not always included.

At the time of writing, the first experimental group in Eastern Highlands Province has completed all the contact hours except the professional studies course. The simulation and the documents prepared for it were very useful in organising the second experimental programme in East New Britain Province to be explained later. In designing the experimental model, the factor of women's roles in child rearing was considered and some mention was made of the fact that the teachers were in their child-bearing years. However, the impact that the model might have on child-bearing was underestimated. Three babies were born to the participants in Eastern Highlands. At times their maternity leave coincided with the ADT sessions, so no additional days were missed in their high schools. The ADT participants brought their babysitters to the sessions to care for the infants in the dormitories. There was very little disruption to the class, if any, because the infants were brought to be nursed during the regular coffee breaks. In fact, the infants and children became active participants in the child development classes.

The Eastern Highlands Provincial Division of Education provided much of the financial support for this project, committing inservice training funds that had not been used the previous year. Without the Division's support the experimental model might not have been attempted. The provincial high schools that the teachers represented frequently provided transport for the teachers. It was not always reliable about arriving on time, forcing the classes to be delayed. At times the blame could be placed on the poor rural roads. Participants coming from very remote areas had to travel by PMV-the local name for public vans or trucks that convey people and goods between communities.

Classes for the East New Britain group are held at the Islands Regional Training Centre-Administrative College in Vunadidir about 40 minutes from Rabaul. Classroom facilities are more than adequate, and ADT staff and students feel that the atmosphere is very conducive for daytime classes and for night-time study. The meals and accommodation are a reasonable cost for the teachers including those who bring babysitters to attend to the infants and nursing toddlers. Generally speaking there were three or four children who came to the Administrative College with their mothers and babysitters. While their accommodation varied from session to session, about 10 to 30 percent of the women returned home at 4 p.m. or 5 p.m. after the classes. They returned the following mornings at 7:30 a.m. to be ready for class at 8 a.m. Some of these women also brought their lunches with them to cut down the overall cost of the training.

Generally speaking those who returned home at night did not perform as well on tests nor in peer teaching assignments as those who stayed at the Administrative College. Apparently their mothering role distracted them but as well they lacked supportive resources and the space to prepare assignments. The participants were encouraged to be information seekers, rather than to be spoonfed with information that they must learn to pass the course. When they had sufficient resources and could ask opinions of their fellow students, they not only grew intellectually, but also formed a cohesive group that shared and assisted fellow professionals. Guy (1987:93) would argue that this is an example of an 'interactive critical community of scholars...seeking additional and more powerful ways to reaffirm the collective values of this society and to initiate group learning strategies'.

While some of this professional growth is planned during the class time-hours, a major portion of it takes place during meals and evening study sessions. In addition the ADT instructor is available for three additional hours on most evenings when students require assistance or merely want to get better acquainted. Preparation for the next day's classes often begins after the evening's study periods. That makes it an extremely long day which taxes the course writer. Crossley (1984) suggests that this extra effort by the originator of pilot projects may be one of the reasons for many projects' initial success and also why many projects fail when they are turned over to someone else. But perhaps it is this kind of extra effort that inspires the students to put in as many hours as they claim. According to their weekly evaluation sheets, most students spend two to four hours studying each night during the residential periods.

The local tutor/coordinator in East New Britain is employed to support students during the residentials as well as during the distance learning periods. We were most fortunate to find a coordinator who had taught Home Economics for many years in Papua New Guinea. She contributes in many ways prior to each session and during the classes as well. The ADT students often share problems with her about the content that they do not feel comfortable to express to the writer. The coordinator arranges for local speakers such as staff of the Department of Health and she arranges tours such as to the hospitals and villages using appropriate technology that is part of the equipment course. She visits schools to observe the teaching styles of each ADT student and provides a variety of assistance to each in obtaining materials that are needed from Goroka. During 1990 she will be more heavily involved in teaching portions of courses. Then in 1991, she will teach the ADT course for the teachers who could not attend during the past two years.

Transportation for the teachers is an easy matter in East New Britain where the roads are good and vehicles are more easily kept in good repair. Rarely is transportation used as a reason for non-attendance or for being late. Sickness is also a rare reason for non-attendance, and then it is generally related to flu, malaria, or giving birth. Few days are missed and the students who are absent are eager to get the materials and teaching aids that they have missed during their absence.

There are a few problems with not having the library resources at the time they are needed. This was especially true with materials for the Family Health Course. Other faculty or students on the GTC campus, in the preservice Home Economics or Health trainers course, check out the resources that the ADT Home Economics instructor or regional students need. For this reason, it would be wise to have a set of materials in the campus library and another set to be used for the year in the region having that particular course. The extra set can also mean that the cost of shipping can be reduced because the books, videotapes and slides would not have to be carried back and forth between each weekly session. Some books and weekly supplies are purchased to leave in East New Britain but not other more costly items.

The cost to East New Britain teachers to attend the experimental model is lower than to attend the traditional model held in Goroka by K130 compared to K235 (Letters, February 1989). From the point of view of the teachers, the experimental model is more favourable in several kinds of resources, for example, human energy resources to travel and prepare the family for an extended absence, time resources related to being away from home and monetary resources.

As far as the cost to the Advanced Diploma Unit, recent figures show that the regionalised experimental model is about the same cost as the traditional model even though the number of students is fewer than anticipated and costs of services of the local tutor/coordinator have been added to the experimental programme.

The December level of performance of the ADT students was noticeably lower than in previous sessions. After a full year with very few breaks from either their classroom or family duties or the Advanced Diploma activities, they were exhausted and ready for a break. One might conclude that too much is attempted during the year and that the pace or amount of content needs to be reduced. It is difficult to balance the amount of content approved by faculty planning and the ability to teach or learn that amount in the scheduled time.

The Emerging Model

As the Advanced Diploma in Teaching approached its fifth year, the Director felt it was time to evaluate the progress and problems of the ADT in greater depth. The Director discussed the problems with each ADT writer regarding course content and the method of delivery. But many others are involved in the upgrading of the provincial high school teachers and they also needed to be consulted as a body so that opinions could be shared and decisions made about the ADT in the

1990s. The Director arranged financing through the National Department of Education and Education III to evaluate the project. Three workshops were carried out in 1988 and 1989.

Workshop I (Guy 1988): This four-day workshop included perspectives from the National Department of Education, the Advanced Diploma Unit, headmasters, graduates, inspectors, academics, present students, and Goroka Teachers' College staff. From these perspectives the progress and problems were exposed to the entire group so that recommendations could be made that would more nearly satisfy all parties involved in the upgrading of teachers. The five recommendations from that workshop were:

1. that the Advanced Diploma in Teaching has a sole objective which is to broaden the subject knowledge of teachers in one subject;

2. that the Advanced Diploma in Teaching be aimed at only those teachers who are substantive at the base level;

3. that the Teaching Service Commission be requested to introduce a prerequisite, to take effect preferably by 1995, which will require all teachers seeking promotion to the level of subject master to have attained a third year of teacher training or its equivalent;

4. that Goroka Teachers' College be requested to develop an inservice distance education model based on the following parameters: -

    4.1 regionally based programmes which include distance and residential teaching components to be introduced by December 1990;

    4.2 a programme which provides only one fare per student per year;

    4.3 a programme which provides face-to-face support for students during the distance teaching sessions; and

    4.4 a programme which maximises flexibility in this model, cooperation with other in-service activities aimed at Provincial High School teachers and alignment with existing programmes where it is appropriate; and

5. the development of this model should be through a series of workshops which include specialist inservice and distance educators as well as participants who are as representative of various interests as those participants at this present workshop (Guy 1989b:121).

Following Workshop I the National Department of Education accepted all the recommendations except No. 3, which had to be negotiated by the National Department of Education with the Teaching Service Commission.

Workshop II (Guy 1989): The second workshop held at Kefamo, near Goroka, aimed to generate organisational and pedagogical models for the Advanced Diploma. The workshop opened with informal papers by specialists in distance and inservice education from the South Pacific region. Thaman (1989:60) shared experiences and research from the University of the South Pacific which were most relevant to the formation of models for the ADT. One USP finding about its courses is that the number of distance assignments ranges from two to 17 per course with most courses requiring between three and six assignments. During the workshop discussion, Thaman stated that students tend to feel overwhelmed if more than four distance assignments are required. By comparison, ADT students generally complete four assignments while in residence and four distance assignments for each course in each semester. Two courses are taken each semester. Students who have completed the ADT do not have difficulty with the distance study except they feel they lack adequate resources (Wari 1989:78). Obviously more research is needed to determine the appropriate number of assignments under Papua New Guinean conditions.

Evans (1989:70) commented on the differences in ability of the students who enrol for ADT and their ability to achieve the high standards expected of them. He raised the issue as to whether there is a need for a bridging or pre-enrolment programme to help students to be prepared for more advanced work. It is important to understand the professional, practical and family needs of the students, and to try to assist them to develop their professional and intellectual capabilities through the pre-enrolment and ADT programmes (ibid:75).

During Workshop II Wari (1989:78-79) gave a review of problems with the current ADT model based on interviews with administrators, ADT staff, and past and present ADT students. One of the problems under administration is the late notification of successful candidates by the Staff Development Unit. Late notification continued in December 1989. Under residential sessions "teachers prefer mid-year sessions (while) school administrators prefer end of the year sessions". Under distance study, teachers complained that assignments can not be done as part of normal school duties. Under reasons for dropping out, "the main reasons are related to social problems while lack of commitment has also been found to (be) another reason why teachers withdraw or defer". Under course content, "different ADT subjects are at different levels (and) the ADU is trying to meet two different needs". Under target group, "it is not clear who the target group was. Different levels of teachers from Levels 1 to 4 have done the course". Under reasons for low intakes, high school teachers feel the incentives are not appealing enough; credit-points toward the In-service B.Ed. degree are not clear yet (and) completing ADT does not qualify teachers for promotion". And finally under staffing, "the Director's position was never planned for and writer/solidus lecturer duty statements are not clear". Many of these and other points were taken into consideration during the group activities that formed the various distance education models.

Two other surveys were mentioned during the second workshop. The first survey of the ADT programme sought Likert Scale view from the students (Guy 1987). The Advanced Diploma Unit (1989) conducted a survey of each new group of ADT students in June 1987 through December 1989 to establish a profile of the ADT stud [illegible] Some points from each survey were mentioned earlier in the paper.

The goal of Workshop II was for the 20 participants to formulate alternative models to guide the decision makers in Workshop III. The varous models are included in the report of the second workshop (Advanced Diploma Unit 1989).

Decision on Recommendation 3

In October of 1989 after much deliberation and data gathering, the Teaching Service Commission and the National Department reached the final decision about Recommendation 3 from Workshop 1.

> That by 1996 teachers seeking promotional eligibility should be three year trained or have gained three year training equivalent by completing either ADT, UPNG Extension Studies or at least one year of B.Ed. For the purpose of this upgrading most officers aspiring to three year trained status, the ADT is seen as the main source of training (Secretary for Education 1989).

That decision puts the onus on the NDOE Staff Development Unit and the teacher training institutions to be sure that the opportunities are open for all those who wish to upgrade their qualifications.

Workshop III: At the same time that the Teaching Service Commission met in Port Moresby, Goroka Teachers' College hosted the final policy-making forum for restructuring the Advanced Diploma in Teaching. Participants included eleven provincial assistant secretaries for education, five representatives of the National Department of Education, four secondary inspectors, one representative of UPNG - Waigani, two ADT student representatives, the acting principal of GTC and four members of the Advanced Diploma Unit, GTC. Throughout the two days deliberation, some 20 GTC faculty members participated when their class schedules permitted. After review of the two previous workshops on restructuring (Guy 1988; ADU 1989), the following recommendations were made (Guy 1989):

1. that the distance materials be strengthened by incorporating dialogic approaches;

2. that the mid-year residential session be eliminated;

3. that the end of year residential session begin the first week of November and finish prior to Christmas;

4. that regular tutorial sessions be run in the field using locally based tutors who meet university appointments criteria;

5. that two one-week workshops, organised on a regional basis, be held each year in each programme (except Home Economics). These are to be held during the the break between Terms 1 and 2 and during the NIST Week period; and

6. These initiatives are to take effect from December.

Beginning in the early months of 1990, ADT staff will formalise the regionalisation and begin to enhance the distance materials and to expand the tutorial bank of the Department of Extension Studies, Waigani and in the University Centres to fit the needs of the ADT.

Comparison of the Three Models

The major differences between the three models are:

- the amount of face-to-face contact in residential settings;
- the use of materials specifically designed for distance learning; and
- the use of local tutors.

Residential Settings

In the case of the traditional model, 24 weeks of the programme are face-to-face residentials without the benefit of tutorial sessions or other types of contact between the residentials. ADT staff have also been hampered by limited knowledge of the day-to-day conditions of the teachers in their schools. Teachers seldom think about the ADT between the residential periods.

Meek (1989) conducted a pilot project to locate volunteer tutors in Southern Highlands Province to see if tutors could increase the completion rate of assignments and enhance the learning of the students. While Meek was able to find them for all students, the experiment was only moderately successful with 40 percent of the teachers taking advantage of the tutors on a regular basis. Perhaps the reason is that, in the Southern Highlands, transportation constraints as well as school and family pressure are hard to overcome.

During the traditional model residentials, the level of intensity of the courses may be somewhat less than in the experimental model as ADT students are given time to complete assignments or to read in the library during class hours. In the East New Britain case, the experimental model consists of a total of 12 weeks of very intensive classroom activity with at least one month between the residential sessions. The frequent contact helps to keep the ADT students thinking about the assignments and to know that they will get feedback about the assignments within a month's time. During the residentials, individual conferences were held with each teacher by the writer to assess progress and to assist them with problems.

In the emerging model, there will only be one residential period of seven weeks which can be conducted either at GTC or in the regions where the majority of the ADT students for that subject are located. Calder (1989), the former ADT science writer, experessed concern that at least seven weeks would be needed to complete the science laboratory work. He also felt that it would be possible to arrange for regional workshops in the national high schools or agricultural colleges around the country which have the type of laboratory facilities needed for the ADT courses. The former agricultural writer felt that working with the agricultural research stations would be very advantageous to the ADT agricultural students.

The Distance Materials

In the traditional model, most of the materials have depended heavily on the residential sessions. While most materials included assignment sheets or books, guidelines for completing the assignments and self-evaluation sheets, the majority of the materials were the printed word and were not dialogic in nature. Only rarely were other forms of instruction included that would fit into the distance format.

In the experimental model, most of the materials depend heavily on the residential sessions but for a slightly different reason. Many materials included audio and visual components that can be used by the teachers in their schools. The writer feels that the lack of teaching aids is one of the reasons why the new knowledge is not incorporated into the classroom when the teachers return to their schools. These materials help the ADT students to keep in mind that the theoretical information they are learning needs to be applied in practical ways for it to serve the Home Economics students. Teachers are encouraged to use these new materials during the peer-teaching assignments that they perform each week. When equipment is needed for the classes, it is either brought from the East New Britain schools or from Goroka or in the case of appropriate technology, it is produced in East New Britain. In any case, the laboratory classes use a minimum of special equipment because the Home Economics departments do not have them at the disposal of the teachers.

The experimental group in the Eastern Highlands was very cooperative in recommending revisions that made the print materials more readable and the visual materials more useful without additional work on the part of the teacher. Many revisions are incorporated into the materials for the East New Britain classes.

In the emerging model, the existing ADT materials will incorporate more dialogic approaches to the distance materials. The aim is to prepare materials that can stand alone, to be used by the high school teachers who may not be able to attend the Advanced Diploma. Women will specifically benefit when their family situations might prevent them from attending residentials. Those areas that demand more laboratory work may need to be restructured to fit the needs of less well equipped provincial high school laboratories to which the teachers have access. Another advantage of the restructuring is that the teachers may take only one course at a time rather than being required to take two courses. That way the load may be lighter for the ADT students, though it will take them twice as long to complete. Again this may be an advantage for female teachers who have several small children or for female and male teachers in small schools where the work load tends to be heavier than in schools with more teachers to share the administrative responsibilities of the school.

Use of Tutorials

With the exception of the pilot tutorial project by Meek (1989), the traditional model did not have organised tutorials. However, some teachers may have formed groups that help the members to get through the assignments in a more organised manner. Because of the long time span between residential sessions, present and former students strongly recommend that tutorials be established under the new Advanced Diploma structure.

In the experimental model, especially in East New Britain Province, the local tutor/coordinator and the writer provide individual assistance to the teachers in their schools. This is a rather different to the proposed tutorials because of the individualistic nature of the contact. It is more costly because generally only one teacher can be contacted at a time due to class schedules. In

Eastern Highlands Province it was even more costly because of the great distances between schools and the poor condition of some roads. As one might suspect, the ADT students in the experimental model who are quite self-sufficient required less tutorial support than the weaker students who relied on personal contact with ADT staff or other 'experts'. These students may be more collectivist rather than individualist (Triandis et al. 1986:259).

Between the residential sessions, the ADT instructor and the ADT local tutor/coordinator were available in East New Britain to conduct on-site visits to the teachers' schools. These frequent visits provide opportunities for the ADT staff to gain support for the programme by interacting with the headmasters. As ADT staff in the traditional model seldom or never visit the schools, this type of interaction does not take place. In addition, the ADT local tutor/coordinator povides assistance during evenings when the East New Britain teachers contacted her at home or arranged to see her at the market as often happened on weekends.

Conclusion

The restructuring of the Advanced Diploma is a complex web of considerations that will be operationalised in 1990. Efforts to incorporate features into the experimental model that are more appropriate for female teachers may be only partly included in the emerging model. For example, instead of the six weeks of residential classes at a time, previously considered too long for women to be away from their families, there will now be a total of seven or eight weeks with primary emphasis to minimise disruption in the provincial high schools and to minimise costs to the National Department of Education. It is more urgent now than before to ensure that organisational and pedagogical constraints for women are considered, as the ADT will become one of the criteria for advancement in the teaching force of Papua New Guinea.

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UP THERE WITH THE ANGELS: PROVINCIAL UNIVERSITY CENTRES IN PAPUA NEW GUINEA

Graeme Kemelfield

My theme is the University in the provinces - what they see the University's role to be and how the University perceives its role in the provinces.

In July 1988 the North Solomons University Centre held a seminar on land management in North Solomons Province, which brought a number of landowners together with academics, lawyers, provincial leaders and provincial government staff for three days of debate. At the end of the seminar, one of the speakers from among the landowners, former national Minister Sir Paul Lapun said to me, 'You know, people living in rural areas think you people at the University Centre are up there with the angels. If only they understood what you were really doing they would be so proud of their centre'.

It was surprising to think that the University Centre's Hilux might be viewed as a kind of heavenly chariot when driving around rural areas for weekend classes. And it drove home to me that the University Centre is the only experience which many urban and rural dwellers in a province, and even many of the provincial leaders have of what the concept 'university' means.

So what does it mean? What do we really perceive the university in a province to be and do? How do we conceive our purposes for existing in a province or, the underlying reasons for running classes and public education programs? What sort of institution are we trying to become? What kind of institution do provincial governments, our students or the people of a province really want us to be? What even do they know about us at all?

Because Centre Directors can rarely avoid being affected by political developments in a province, we may need to think about these things sooner rather than later. So I have tried to think through the situation of the North Solomons University Centre, in the hope that it might stimulate other directors to express the different roles they envisage for their centres, and also to gauge the reactions of main campus staff to this new family of baby birds squawking in their extended nest.

Our View of Ourselves and Our Place in the Province

I want to start by throwing out a few, possibly provocative remarks about the relationship of university centres to the Extension Studies Department and the main University of Papua New Guinea campus as a whole, as well as the relationship to our provinces.

As a University Centre, it is evident that we are a branch of the University and its Extension Studies Department. However, at the same time, it is equally apparent that we are not simply a branch office or study centre of the department.

It is also obvious that we are not a full campus like the main campus of UPNG or Goroka Teacher's College. And yet - and this is the main point which underlies everything I am trying to say - I believe we are nevertheless a microcosm of the University as a whole. We are the University in miniature. We need to see ourselves that way and to behave that way.

This does not mean that we need to be pretentious, or pretend to be bigger or more important than we are. It also does not mean that we should deny our academic roots in the Department of Extension Studies. It is a question of our relationship. Like birds in the nest, we rely on the department for sustenance, it is our parent body. And yet we nevertheless do have an independent life of our own.

When the North Solomons University Centre was being established in 1982, there were intense discussions between the UPNG and the North Solomons authorities about the nature of the institution. The Vice-Chancellor at that time, Dr. Elton Brash and the Director of Extension Studies, Professor James Griffin were very definite about the need for the centre to have a strong provincial identity. That was why they wanted it to have its own crest, incorporating the UPNG crest. They wanted the provincial authorities to be able to identify with it as a provincial institution. After all, most of its direct funding has to come from provincial sources, and that was why the then Vice-Chancellor proposed the wording on our notepaper, "A joint project of the University of Papua New Guinea and the North Solomons Provincial Government".

In that partnership, the Vice-Chancellor emphasised that he wanted the centre to be tilted towards the province in establishing its character and sense of identity; at the same time, the provincial secretary and planner made it clear that they wanted the centre to be under the ultimate authority of the University of Papua New Guinea, so that its stability and steady development would not be too vulnerable in the face of political changes of mood in the province - something our advisory committee has also tended to support. They wanted a sense of the University's presence in the province.

It is important to make one further point, that for the great majority of students in the province, the buildings and grounds and staff of the centre are the university. As a physical entity, the Department of Extension Studies is largely unknown, except for a few who have studied or attended Lahara courses at the Waigani campus. So when the old information sheet supplied for students began saying 'The Department of Extension Studies is located on the third floor of the Arts I building', it might as well have been describing somewhere on the moon.

Now, I do not think there is anything for the staff of the Department to worry about in this. On the contrary, I would say that the Department comes alive in the province through the physical entity of the University Centre, and that the letters and papers for students which come from the Department need to reflect this reality.

Turning to our relationship to the province: while again making the obvious statement that we are not a full campus, nevertheless in a real sense our campus is the town and the province. The North Solomons University Centre is increasingly mobile, with some sixty students enrolled in rural areas. Its public education and cultural programs are taken on tour around the province wherever possible, especially to rural high schools.

If you walk out of our office or classroom door you are in the Arawa public gradens. At the end of our path is the main road of Arawa Town. We are in no sense an enclosed institution, and this is a deliberate policy.

Our public events are attended by large numbers of people from all over the town as well as rural areas. I have mentioned the recent land management seminar attended by a number of rural landowners as well as government officers. Another example would be the free public concert given by the Barrett Sisters, which drew an audience of many thousands of people. The funding to accommodate the sisters was raised by the combined churches of Arawa and Kieta, while much assistance was received from the private sector. Another example of our public involvement would be that of the Arawa Fermentary renovations and the Henry Moses Memorial Training Center, where an education complex under the centre's management is being planned which is intended to provide facilities for staff development for the government, unions and the private sector, as well as for cultural and educational events for the public at large.

Nevertheless, we remain a recognisable institution, a 'university', with all the conflicting emotions that word can evoke in a province - which leads me to consider what are some of the provincial perceptions of our University Centre.

Provincial Perceptions of the University Centre

For some, the University Centre is undoubtedly a kind of super school, a place for a privileged elite to continue their studies, or for the highly educated to carry on discussions in the stratosphere - up there with the angels.

From a student perspective, more realistically, it is a place where those who, for all sorts of reasons, have had to cut short their education in the past, can get a second chance to take up studies. Perhaps this was because their earlier school results were poor, or they had to go home to help their families or to assist them financially, or they had marriages arranged for them, or they got into conflict with school authorities, or were confused by school guidance, or they were late developers and lacked confidence, or in the case of older students, lacked opportunities when they were younger for continuing their education. The centre's students range from 17 to 64 years old, and are from every occupation and background.

For yet others, we may be viewed as a place for people to pull themselves up in the world, get a promotion or a better job, realise old ambitions, or just to find out how far they can go or what they are capable of achieving.

From the government's perspective, the centre may constitute a significant resource for undertaking research, organising seminars and forums, assisting in policy formation or in staff development; for schools and for urban and rural communities, we may be viewed as a source of entertainment, enrichment and a window to a wider world, through the provision of educational films, public seminars and popular cultural events; or for the private sector, a means of upgrading the basic skills of their staff.

There are all kinds of reactions and ways of seeing the centre's role. But what seems to be common to students, provincial government, rural leaders or private donors is that they want the development of a centre they can be proud of, not merely a modest study facility or a poor little orphan begging for funds. The evident pride shown at the reception for the Barrett Sisters and the professional handling of their concert was unmistakable.

Several months ago, by chance, I picked up a scrap of paper lying on the path to the centre. It was a note or letter written by one of the College of External Studies students using our classroom for daytime study. It read, "The Arawa High School boys say we are rubbish, because we do not have school uniforms. And we tell them, we study at the university." For them and for others we have to create, through their experience of us, the sense of a university and pride in its existence.

What Then Is a University?

So finally we are brought again to confront the question, "What is a university?". And more particularly, what is the meaning of a university in the Papua New Guinean context, or if you like, in Melanesia?

We could go into flights of historical and philosophical speculation about this. So I will rather make a stab at a definition, by throwing out a few ideas which inform my sense of how the North Solomons University Centre should be developing.

Let me start with some conventional ideas and ideals. In general terms, you might consider a university to be a place for intensive study, thought and discussion of high quality; for disciplined learning, awareness and discovery; and more specifically, as providing an introduction or bridge to specialised technical and professional activity, including knowledge of the ethics of professional conduct.

I think it is important that we do not restrict our sense of what we are doing to the notion that we are just teaching subjects for so many credit points. Students are, or should be, learning a whole approach to a subject: the tools and methods which an historian or a mathematician or a biologist or a poet works with. Our teaching books and our teachers should be oriented that way, however basic the level. It was quite a revelation to me at our last Lahara session to observe a committed, imaginative teacher drawing students out from a fear of dislike of Mathematics and helping them to think through some or the basic concepts of the subject. His class included the strugglers who we would normally anticipate failing or dropping out. And the process was evidently a struggle, and also a revelation for many of the students themselves of the discovery in learning.

Three Aspects of Quality

If we talk, then, of a university being a place for work of high quality, I will try to relate three important aspects of this notion as they apply to the development of our centre.

Firstly, we should weigh the quality of thought and analysis which the centre encourages. This involves consideration of our approach to teaching as well as of our course materials. We need to avoid the danger of a mechanical, lock-step kind of learning by students in an extension program which is built around the completion of weekly units. But it applies equally to the rigour which goes into our research, into seminar discussions and into our consultancy work.

Secondly, we need to consider the way in which the centre encourages creativity and discovery. As an example, in addition to creative writing workshops in which young writers have access at any time to the centre to bring their work for discussion, poetry and storytelling recitals are organised at which these writers can read their work in public during cultural festivals.

An anthology of new writing from the North Solomons is also in the making, which is intended to provide a model for school students of writing of quality produced in the province. As a further example, the recording and translating of traditional chants as part of research into the history and traditions of the North Solomons has led to the rediscovery of old language forms, as well as insight into a unique form of cultural expression.

A third consideration is the manner in which the Centre encourages an understanding of the wider world, and the promotion of social awareness and social justice, surely a legitimate aim of a university. The centre has used film festivals and cultural festivals as a means to attain these goals, with particular concentration on provincial high schools. Among examples are a Black American film festival, which included films on the lives and thought of Martin Luther King Jr. and the Rev. Jesse Jackson, and the role of religion in the historical struggle of Black Americans, and films on U.S. involvement in Nicaragua and nuclear testing in the Pacific. The centre has attempted to encourage a weighing of the positive and negative values inherent in the history of a country such as the United States. Further examples of such an approach would be found in the Australian Aboriginal Cultural Festival, and the Centre's deliberate association with the promotion of an Amnesty International group in the province, which is able through seminars and video showings to educate the public on the significance of human rights, and the importance of safeguarding them in PNG, through an awareness of social and political events occurring in other countries of the world.

Keeping these three goals in mind gives a sense of direction and purpose to the centre's programs, and an attainable quality to its work. As our research officer has commented, it enables us to make more sense of the whole endeavour.

A University in Melanesia

I suggested earlier we should not only be thinking about the role and qualities of a university, but of what we conceive a university in Melanesia to be. In North Solomons Province we are trying very hard to cultivate three aspects of the centre's work to adapt it to this environment.

In the first place, we put a lot of emphasis on exploring and strengthening awareness of the province's cultural heritage. This is exemplified by public seminars on archaeological findings in the province and on traditions of chieftainship, research into the province's history and traditions, and cultural exchanges such as the visit of the Australian Aboriginal group.

We are also trying to build up the centre as an educational force in the community, not only by extending classes around the province, but by making many of its events as widely accessible as possible to the general public. We encourage an environment which makes any visitor feel at home. It is not unusual to see a remarkable range of people present at our film showings, from provincial government leaders to rural landowners and families from squatter settlements, many of whom do not speak English. This requires us to make careful provision - to choose films which communicate effectively in visual and human terms, and to make considerable use of tok pisin in seminars and forums for explanation or discussion.

Finally, we recognise that if we are seeking a high level of thinking and analysis and basic knowledge, then that can reside as much in the unschooled and illiterate - who are professors in the oral culture of their own community - as in the tertiary educated. Their involvement has been a feature of most of our larger-scale public seminars since the first on 'Leadership in the Community' in 1982, and they have involved many participants from rural areas over the years. One such speaker in a seminar on 'Forestry, Logging and the Environment' was stopped by Chairman Ephraim Makis who exclaimed, 'Old man, you are a walking encyclopaedia!'. Witnessing senior government officers and academic speakers at our seminar on 'Land Management in the North Solomons' grappling with problems together with rural landowners, every bit as clear-headed and thoughtful as they, prompted the Lands Secretary, Karipe Pitzz, to write that it was 'the very best seminar'.

Cultural awareness, accessibility, and combining the wisdom of the highly educated in both modern and traditional spheres have been at the heart of the centre's experiment - to create a university responsive and relevant to its environment in the province and in Melanesia.

Conclusion

I want briefly to draw two final conclusions from our experience in creating a university centre. Firstly, we must create a clear image of how we are evolving and what we are trying to become - and if necessary, to revise that image. Secondly, we must allow centres, to a reasonable extent, to have their own evolution and to develop in their own way, while allowing for a cross-fertilisation of ideas and experiences. An enforced similarity of development will restrict the essential participation of those in the provinces concerned to shape centres as provincial institutions responsive to their visions and needs and the creative impulses of their staff.

The provincial university centres, as they are developing, have the potential to become a unique experiment in the genuine and creative decentralisation of tertiary education within a Melanesian environment. In doing so, they will help to redefine the concept of a university for our time and place.

DISTANCE EDUCATION AT THE PACIFIC ADVENTIST COLLEGE: AN EVALUATION

Laurie Meintjes

The First Five Years: An Overview

Located 20km from Port Moresby along the Sogeri Road, the Pacific Adventist College (PAC) is a tertiary institution operated by the Seventh-Day Adventist Church (PAC) for students throughout the South Pacific. The college opened in 1984 with an enrolment of about 100 students, most of whom resided on the campus which has accommodation for both single and married students. Current enrolment is 150. Full-time programs are taught by an academic staff of 28 which include two-year diplomas in Secretarial Studies and Theology; three-year diplomas in Education Business (AAT) and Agriculture Business Management; and four-year degrees in Education and Theology. The college is established by its own Act of Parliament, the Pacific Adventist College Act, 1983.

During PAC's first year it became evident that a greater than expected number of students were not coping with tertiary work. Common to these students, when compared with the more successful ones, was a reduced ability in English. After trying several solutions (e.g. remedial English classes) the College decided to develop an English course and teach it externally to prospective PAC students who scored below a certain minimum in an English qualifying test - the test to be given to all applicants whose ability in English was suspect. Any applicant required to take the English course would do so before coming to PAC. The course, Preliminary English, was first offered in 1985 to 35 external students - a small beginning to our distance education program. Although still small, the program is growing.

Since 1985 we have added a second English course, two courses in Accounting, and one course each in Mathematics and Geography, all at Year 12 level and thus constituting our Preliminary Program; four courses at diploma level; and one at degree level. Development of further courses, notably for a diploma in primary education, is progressing as time allows. Our earlier courses were poorly written, but later ones are much better and reflect our growing experience in the practice of distance education. Enrolments have gone from 35 in 1985 to a total of 471 today, being 357 in the Preliminary Program and 114 in the Associate Diploma of Administration. Of the 471 enrollees, 167 have completed a unit, 103 are active, and 201 are considered to be inactive - an attrition rate of around 43%. Whilst high, this is perhaps acceptable under the circumstances. The general level of student performance amongst preliminary students is low, this being due partly to their poor academic background (most of the preliminary students fared poorly in Year 10 or never made it that far), our lack of an adequate student-support system, and - arising from this lack - the inability of many students to cope effectively with the distance medium. The ADA students, although academically more capable than most of the preliminary students and generally returning work of a higher calibre, are progressing slowly, only a few students being in the final stage of the course.

Administrative Structure And Staffing

The relationship of extension services to the other departments of the college, and to the college generally, has never been fully clarified. Initially, while our primary responsibility was to develop and administer the preliminary program, this did not matter too much as our activities were outside the regular academic life of the college. Extension services at PAC thus evolved into a state of semi-autonomy, enjoying substantial freedom under the final control of the PAC administration. However, with moves to develop PAC as a dual-mode institution, we are now defining the status and function of extension services, especially as it relates to the teaching departments which, in a dual-mode context, will be expected to work closely with us and we with them.

We have three full-time staff: a chairman responsible for the overall direction of the department; a lecturer who tutors in the English program and assists with the writing of courses; and an administrative secretary who handles correspondence, enquiries, records, wordprocessing, and materials production. Some of the regular teaching staff help with the development and tutoring of courses within their expertise, but generally such help is very limited.

If the preliminary program was our only concern, then our current level of staffing - aside from the fact that we have no proper student support system - is adequate. However, we are increasingly hard-pressed to keep up with an involvement in new areas and the need for additional staff is becoming acute.

Course Development

While development of distance courses draws its inspiration from an expanding and increasingly reliable body of theory, our course development practice has been keenly influenced by the work of one man, Borje Holmberg. Holmberg places great emphasis on the distance student and advocates a writing style that not only keeps the student in focus, but which specifically seeks to involve him or her in meaningful dialogue. His theory, in our view, comes closest to investing distance teaching with a sense of immediacy and rapport which, according to some critics of distance teaching, is its greatest lack.

The Preliminary Program

Our initial brief to develop a series of courses at matriculation level is largely complete. Course quality varies, with earlier courses reflecting our professional naivety, but later ones being much better, thanks to my studies in the distance education program at the South Australian College of Advanced Education.

The Associate Diploma in Administration

The ADA courses are of average quality, and if the program is to be continued, then it would be best to revise its external units.

The Regular Diploma/Degree Program

The development of external courses for our regular program is a new venture, and one which promises a much wider fulfilment of PAC's regional role. And it is a venture that excites me, because I believe that a capacity to teach courses off campus will enhance our capacity to teach them on-campus. Distance education is on the threshold of what might become its master work - the amelioration of on-campus teaching. Call it a 'closing of the distance' if you will, an issue that is attracting much worthwhile attention. In several dual-mode institutions across our region, distance education materials and methods are playing an increasingly vital role in on-campus teaching, allowing teachers and students more flexibility in the teaching/learning exchange, thus leading to an enriched academic environment. External units will also give PAC more scope to meet exigencies due to staff shortages. We have completed one degree course, Advanced English Writing, and are working on units for the Primary Teaching Diploma.

Enrolments and Student Performance

The Preliminary Program

After a slow beginning, student enrolments are now satisfactory, and we are having to cut back on acceptances so that we do not overtax our tutorial capacity. Cumulative details to date are:

Course	Enrolment	Completed	Active	Withdrawn	
English 1	260	64	49	145	(56%)
English 2	44	19	14	11	(25%)
Accounting 1	41	15	2	24	(58%)
Accounting 2	4	1	1	2	(50%)
Maths 1	8	3	2	3	(37%)
Totals	**357**	**104**	**68**	**185**	**(52%)**

The Associate Diploma in Administration Program

The ADA program, a combination of distance study and on-campus blockstudy, trains national workers for leadership roles in our denominational work throughout the South Pacific Region. There have been two intakes of 21 and 43 students, all students having been nominated and sponsored by their respective unions. Cumulative details are:

Course	Enrolment	Completed	Active	Withdrawn	
Comm. in Adm.	64	34	14	16	(25%)
Pers. Man.	25	19	6	-	
Org. Ldshp.	15	10	5	-	
Asp. of Org.	10	-	10	-	
Totals	**114**	**63**	**35**	**16**	**(14%)**

The ADA figures appear satisfactory, although it should be pointed out that the program is now in its fourth year and no student has yet completed all four units. This suggests that our withdrawal criteria are more tolerant than those of distance education programs generally.

Evaluation of the Distance Education Program at PAC

Given the tight constraints (scope, finance, facilities and staffing) within which our distance education program operates, and the circumstances of our students, the program is doing reasonably well. However, in comparison with some other distance education programs in our region it is perhaps sub-standard, and there is much room for improvement.

Evaluation Criteria

It is difficult, perhaps impossible, to be completely objective in the evaluation of a department of which one is the chairman. To make the task less subjective, we will assess our program against the following ten criteria:

The success and effectiveness of the distance education program will be shown by:

- a high degree of interest in the program, as indicated by significant numbers of students enrolling in the program:
- the capacity to retain, on an active basis, 65% of initial enrolments for a period of at least one year;
- a successful completion rate of at least 55% of enrolments;
- the capacity to maintain a viable program of student support;
- a good level of continuing students (i.e., students who, after completing one course, enrol in another);
- the capacity of the preliminary program to prepare students for entry into PAC;
- the suitability of course materials in terms of their educational soundness and fitness for the distance mode;
- a continuing capacity to develop new courses, and to revise current courses as and when necessary;
- the strong and willing support given to the program by the teaching departments of the college; and
- an ability to operate within budget constraints.

Criterion 1: Degree of Interest as Indicated by Enrolments

The Preliminary Program

Three hundred and nine students have enrolled in the preliminary program in five years, an average of 60 new enrolments a year. The total number of unit enrolments is 357, which gives an average of about 72 per year. On a year-by-year basis the enrolments have been:

Year	First-time Enrolment	Continued Enrolment	Total
1985	39	—	390
1986	114	5	119
1987	62	14	76
1988	52	19	71
1989	42	10	52
Total	**309**	**48**	**357**

Enrolments in the preliminary program are satisfactory, given our small capacity. The higher enrolment in 1986 was probably due to an advertising campaign which by then was beginning to take full effect. And in 1986 we reached our tutorial capacity limit and since then have been enrolling new students only as places are available. Also, we have tightened up on entry standards and this has reduced the number of persons eligible to enter the program.

The ADA Program

Sixty-four students commenced the ADA program in 1986-87, and total enrolments in its four units to date are 114, being 64 for Unit 1, 25 for Unit 2, 15 for Unit 3, and 10 for Unit 4. The decreasing number of students proceeding through the units does not necessarily reflect a diminishing interest in the program, but rather a much slower than expected rate of progress.

Criterion 2: Capacity to Retain Active Students

The Preliminary Program

A retention rate of 65% of enrolments is acceptable for non-compulsory external programs, most of which can be expected to lose about 30% of their enrolments within the first few months but few thereafter. The overall retention rate for the preliminary program is 48%, which is disappointingly low. The retention rate for first-time enrolments is 44%, but for continuing enrolments it is a much healthier 66%, with the rate for English 2 being 75%.

Our high rate of attrition is due to several factors. We lack an adequate student-support system; our students, generally, come from poor academic backgrounds (most were unable to secure a place in a senior high school because of inadequate grades); several students, especially in

Accounting 1, previously failed the unit in the on-campus mode and seemed poorly motivated. Also, earlier units were not as good as they might have been.

The ADA Program

As noted, the ADA withdrawal rate of 14% is actually much higher when we assess student performance over the whole program rather than for individual units. If, for argument's sake, we were to draw the ADA program to a close now, then at best only ten out of 64 students will complete the program, assuming the ten students now enrolled in the final unit in fact do finish. This gives a chastening withdrawal rate of 85%. Generally, the ADA students are academically capable (they were screened carefully on entry) and so their slow progress through the program is not necessarily due to lack of ability. What are the problems?

Firstly, insufficient time was allowed for the development and setting up of the program. Ideally, about two years should have been allowed for this task, during which period the circumstances of prospective students could have been fully investigated, courses developed and coordinated one with the other and possibly field tested, and a proper infrastructure established so the program could be adequately implemented and maintained and the students properly supported. We scurried through this preparation period in less than a year, concentrating on course development (but no field trials) and the vetting of prospective students, and making only token gestures towards such items as student support and tutoring.

Secondly, the program has not been conspicuously directed from one quarter which has tended to compromise its quality. This has had more effect on the first intake of students who were perhaps the guinea pigs of the exercise.

Thirdly, as a result of the lack of clear direction as already mentioned, several of the ADA students were enrolled in simultaneous programs either here at PAC or our Avondale College in Australia. Although students in this double-program situation were advised not to allow one program to interfere with the other, I wonder whether such advice can ever be followed. To enrol students in concurrent study programs is poor planning and is unredeemed by hollow advice to avoid letting one program inferfere with the other: two such programs will always interfere with each other. Unfortunately, from our perspective, it has been the ADA program that has suffered because it has been accorded the lower priority.

Fourthly, some ADA students - all of whom work for the church - are genuinely pressed for time. To ask workers on a particularly full workload (which for some categories of workers is excessive) to undertake an upgrading program in their so-called spare time, is unrealistic. However, it must be said that many of the ADA students are given adequate time off for study, and also that there are those who have ample time but somehow manage to spend it on other 'priorities'.

Finally, ADA students are working in a second language context and generally need more time than a native English speaker to understand a given piece of academic work. Written assignments will also tend to be less fluent and more doggedly constructed.

Criterion 3: Successful Completion Rate

The Preliminary Program

I have suggested a successful completion rate of 55% (i.e. 55% of first time enrolments) as this seems to be something of an expectation in our region, or at least it is a figure that UPNG are prepared to live with for their preliminary type programs. Our success rate, at best, will not exceed 40% for our current crop of students. Nevertheless, there are signs that this rate is improving.

The ADA Program

The successful completion rate is good for Units 1,2, and 3 (53%, 76%, and 66%, respectively), but disastrous for Unit 4 (1%). As Unit 4 is the final unit of the ADA program, the success rate for the whole program is zero. Again, a chastening result.

Criterion 4: Capacity to Provide Student Support

Our student support program is very limited and this is probably the most significant factor militating against better success in our distance program. Student support should be dynamic and pervasive, and not - as ours tends to be - mere crisis management. Adequate, effective student-support comprises three main elements: a network of local centres where qualified staff are available to assist students as and when needed; competent tutoring from the institutional staff responsible for marking and commenting on students' assignments; and a sensitive and caring attitude towards students by the institution itself. While PAC scores well in this last area, we are not so strong in the other two. We have no local centres, and our tutorial capacity - although generally adequate - is in need of professional guidance, our new Tutorial Guide being an attempt to remedy this problem.

Criterion 5: Numbers of Continuing Enrolments

The Preliminary Program

Continuing enrolments are 16% of first-time enrolments, or, more significantly, 62% of successfully completed first-time units (or prerequisite units). This is quite acceptable as it confirms that considerably more than 50% of successful students are going on to study other units.

The ADA Program

Continuing enrolments, as a percentage of those who have successfully completed the previous prerequisite unit, are as follows:

Students going on from Unit 1 to Unit 2 - 74%. Students going on from Unit 2 to Unit 3 - 79%. Students going on from Unit 3 to Unit 4 - 100%.

On their own, these figures appear very satisfactory; but as a percentage of initial enrolments (i.e. the 64 students who commenced the ADA program) then the rate of continuing enrolments is very poor, being 16% overall. If a significant number of the still active students finally complete the program then the rate may go to 25%, but probably no higher. Given the adverse circumstances under which the ADA program has laboured, these figures are not surprising. However, if not surprising, the figures are also not acceptable.

Criterion 6: Preparing Students for Entry into PAC

Ten PAC students have entered PAC via the preliminary program, or have been substantially helped by that program. A further six students completed some work in the preliminary program prior to entering PAC. And one student successfully completed three subjects (English 1 and 2, Accounting 1) and might have entered PAC this year had he wished. The academic performance at PAC of students associated with the preliminary program ranges from poor to very good, the majority doing quite well.

Criterion 7: Suitability of Course Materials

Since those first, naive attempts to develop external courses in 1985-86, our courses have improved considerably, and are - in my subjective view - equal to those put out by either UPNG or USP. Not only are our courses now better presented in terms of layout and general appearance, but they are also very much better as distance texts in that they reflect appropriate techniques and practices. With the proposed purchase of a laser printer this year, the presentation of courses will be further improved.

Criterion 8: Capacity to Develop and Revise Courses

Since 1985 we have developed eleven new courses, these being six Preliminary units, four ADA units, and one for the degree program. We are working on two units for the Diploma in Primary Education. Also, three preliminary units have been and are being extensively revised. We are satisfied that our program of course development is going well, given the few persons who are able to contribute to the program and the painstaking nature of the task.

Criterion 9: Level of Interdepartmental Support

This is one criterion I wish I could report on more sanguinely, but the level of interdepartmental support has been quite low - an experience common to many dual-mode institutions. In our case the problem lies in a system, rooted in the Protestant work ethic, that seems - in a doctrinaire sort of way - to expect staff to be ever ready and able to meet all contingencies and to still discharge their primary tasks with professionalism and distinction. That some are able to do this is grounds for gratitude and wonder; it is not the standard against which general performance is to be measured or expected.

Criterion 10: Ability to Operate Within Budget

Our current budget is around K100,000 annually of which the ADA component is about K40,000. We have been able to keep within this budget. However, to be realistic, a budget of K100,000 annually is insufficient for a distance program of the scope that we are attempting or envisage. An annual budget of around K250,000 would begin to be adequate.

Evaluation Summary

On balance, our distance program is inadequate in several important areas. It lacks sufficient courses to be truly viable, especially at the diploma or degree levels; it has no formal system of student support; it does not enjoy the full, active cooperation of the teaching departments of the college; it has insufficient resources for the task that it has set itself, and - as a result of all of the above - it is not succeeding well enough in terms of students performance and perseverance. On the bright side, however, we are aware of our problems and are addressing them.

Looking Ahead - the Next Five Years: A Specific Program for Development

Course Development

Our long-term aim is to have half our diploma and degree units available in the external mode by the year 2000. In the short term (five years) we hope to have half the diploma units available externally, or at least enough units to allow diploma students the option of completing the first year off campus - about 30 units.

Effective course development cannot be carried out either quickly or casually, a fact which is clearly confirmed by our own experience and also by my recent survey of ten dual-mode institutions. Course development at these institutions involves a cooperative effort between academic staff and an external studies department, usually working as a course team. The development time for a one-semester course appears to be highest at Deakin University (12-15 months) and lowest at the University of New England (3-6 months) - the average being about 9 months.

Based on this nine-month average, and assuming a basic course team would includes a chief writer, an editor/reviewer, and a distance expert, then their individual full-time involvement in the development of one-semester course might reasonably be:

Writer	5-7 months
Editor/Reviewer	1-2 weeks
DE Expert	2-3 months

To develop 30 new courses over the next five years will require a total time investment of about 280 staff-months, being 180 months by writers, about 10 months by reviewers, and about 90 months by DE editors/writers.

Faculty members involved in the writing of external courses will receive direct guidance and assistance from extension services. This assistance will focus on the distance element of the materials and will include such aspects as layout design, the appropriateness of language and presentation, the inherent coherence and organisation of the materials, and the use of in-text cues and guidance. A Course-Writing Guide and Style Guide will be available for staff engaged in course development.

Student Support - Regional Centres

Regional centres are a key element in the success of a distance program, especially in the South Pacific context where distance learning is relatively new and students need constant encouragement and help. The main function of each centre, via its director, will be to provide pre-enrolment counselling and assistance to prospective students, to support enrolled students by encouraging them towards success in their programs, to facilitate contacts between students, and to provide a public relations service for the college itself. Initially, we could open four centres as follows: Suva, Honiara, New Guinea Mainland (Lae), and New Guinea Islands (Rabaul). Directors would need to have a travel budget to enable them to visit the more isolated students once in a while.

Staff Establishment

Three categories of staff contribute to the running of a distance program at a dual-mode institution. Firstly, there are extension services' staff who are responsible for the overall administration of the distance program and for providing expertise and assistance to regular staff in such areas as course writing and tutoring.

Secondly, there are the regular faculty members who write the distance units and who are responsible for tutoring. And finally, there are the Centre Directors who support and assist students in the field. Let us look at each of these in turn.

Extension Services Staff: We have three full-time staff members: a departmental chairman, a course developer cum tutor, and a secretary. This is adequate for a low-key program covering preliminary units only. However, for the proposed new program, we would need (by about 1992) at least two additional distance education specialists whose primary task would be to guide staff in the writing of distance education courses and to edit the final product.

Regular Faculty: As noted, it is the usual practice at dual-mode institutions throughout our region to involve regular staff in the development and teaching of distance education courses, the rationale being that where internal and external students are enrolled in the same programs and face common examinations, they should also have the same teachers. Where regular faculty members are involved in an external program, there is generally a compensatory reduction in their on-campus duties. Ideally, this should always happen. For example, teachers writing an external course might be relieved of all teaching duties for a certain period (say, one semester) or placed on a reduced load over a longer period. There are also compensatory formulae for staff who tutor in the external program. If we are to function as a dual-mode institution, then we must adopt the same reciprocal policy.

As noted, to write 30 new courses will take 180 staff-months, which is equivalent to three full-time staff over five years. This is therefore the level of additional assistance that faculty members will require. There are different ways in which this assistance might be given, and the teaching departments should be allowed to decide which is best for their situations. Some departments may prefer extra teaching help so that lecturers can be released for writing, whereas others may prefer direct help with the actual writing of the courses.

Centre Directors: Four Centre Directors should be appointed in the first instance, the appointments to take effect from early 1992, which is about the earliest that we could offer diploma units at a distance. Centre Directors should be carefully chosen and well prepared for their task. Ideally, a Centre Director will be a graduate of PAC (and thus strongly positive towards PAC and likely to inculcate similar feelings in students), of an outgoing nature, and one who has completed relevant units in the practice and processes of distance education.

Staff Training

Formal training in distance education is not readily obtained in our region (only a few programs are available and entry is competitive) and so it may be best to conduct a selective training program ourselves via a mix of external study and face-to-face sessions. With help, perhaps from the Education Department, extension services can mount such a program. A tentative, three-unit program would consist of:

Introduction to Distance Education: A look at the theory and practice of distance education, and an examination of its recent development, especially in tertiary education. The major aims of the unit are to emphasise the practical nature of Distance Education and the fact that it does work, and to foster an understanding of how the medium operates. The unit is for new extension services staff, including Centre Directors. Other interested staff may also take the unit.

Course Development: This unit takes a close look at the course-development process, covering such aspects as planning, design, format, content, and language style. It aims to help writers of external courses appreciate the situation of the distance learner and to appreciate the need for special techniques and strategies to engage that learner and to present material as lucidly as possible. This unit would be of benefit to all staff involved in the writing of external courses.

Student-support systems: This unit will be presented in four parts. Part 1 looks at student support in general, showing how student support pervades the whole distance education process. Part 2 looks at how the support system is designed and implemented (i.e., procedures, processes and records), Part 3 focuses on the role of the tutor in distance education, presenting that role as a crucial function in the distance education process and offering practical suggestions for effective tutoring. Part 4 looks at the role and functions of the Centre Director. Extension services staff (including Centre Directors) will take all four parts, while staff tutors need take only Parts 1 and 3.

Conclusion

Distance education, generally, has struggled for acceptance - struggled against misunderstanding, ignorance and even academic elitism and arrogance. Consequently its success is won with greater difficulty, because it must first overcome the barriers of prejudice. However, these barriers are coming down - at some institutions they are perhaps already down - and I am becoming more positive about the long-term prospects for distance education at the Pacific Adventist College. Although our distance education program has made a faltering start (responsibility for which lies as much with extension services as it does with the corporate college), I believe we can now see where and why it has faltered and are more prepared to do something about it.

JUST PUBLISHED

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WHAT MATTERS IN FACE-TO-FACE AND DISTANCE LEARNING OF MATRICULATION MATHEMATICS?

Gurcharn Singh Kaeley

Background to the Study

This investigation looks at the effect of socio-economic status variables, entry style variables and instructional variables for achievement in mathematics at matriculation level of 1984 and 1985 internal regular, mature, and external students of the University of Papua New Guinea (UPNG).

Matriculation is normally acquired through successful completion of Grades 11 and 12 at a national high school in Papua New Guinea. However, many indigenous students aiming to enter the various institutions of higher education have completed only Grade 10. It is generally recognised that such candidates are inadequately prepared to embark on tertiary education. For a number of years, therefore, both universities in the country made provision for a one year post-secondary (pre-tertiary) matriculation programme. At UPNG this was called Preliminary Year (PY). The successful completion of PY allowed Grade 10 holders to matriculate and commence undergraduate studies. The PY course has ceased to exist from the beginning of 1988 because of change in the government policy.

Matriculation at UPNG can be achieved either through (PY) or through Matriculation Studies (MS). The Mathematics course for PY was conducted for internal students by the Department of Mathematics and the course for MS was offered to the external students by the Department of Extension Studies. External students were taught through correspondence, supplemented with weekly two-hour tutorials at university centres around the country.

The population for this study was divided up into three groups. There were internal students studying in PY and external students doing MS. The internal students were further divided into two categories; those students who joined PY immediately after completing Grade 10 called school leavers (SLs), and those entrants who enrolled in PY after a year or more away from formal academic studies termed non-school-leavers (NSLs). External students called distance learners (DLs), were at least 21 years of age and had a minimum of two years work experience.

Students' Mathematics performance, in the one-year course, is determined by continuous assessement in the form of assignments, tests, and a final examination. At the time of the study, the assignments weighted 20 percent, tests 30 percent, and the final examination 50 percent. Performance was assessed twice during their course. The first assessment called Achievement 1 was given at the end of the first semester, and the second assessment known as Achievement 2 was given at the end of the year and covered the whole year's work.

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Problems of Learning Mathematics in Papua New Guinea

Mathematics is a difficult subject both to teach and to learn due to its hierarchical nature (Skemp 1971). The learning of Mathematics becomes more difficult for Papua New Guinean students due to generally low standards of Mathematics in the country (Bacchus et al, 1985). There is ample evidence that, in Papua New Guinea, the development of numeracy and of fluency and literacy in English lag behind rates of progress taken for granted elsewhere.

The mastery levels of basic skills for the average matriculation entrant are judged by some to be between two and six years below the nominal level (ibid:84). There are many reasons for the low standard of mathematics in Papua New Guinea. Bacchus et al (1985:75, 113) in the report on upper secondary education in Papua New Guinea suggest that two major reasons are: the historical recency of the introduction of the forms of knowledge on which the curriculum is based and the rarity of persons as role models who have had the opportunity to master those forms of knowledge in the population. It is such people who set attainable standards for the next generation. There is also a low level of Mathematics education for teachers. Lancy (1983:7,8,174,189) has also conducted a major research project to study the factors contributing to this state of affairs. He believes that one of the main contributors towards the poor standard of Mathematics in the country is Papua New Guinean culture which interferes with the cognitive development of children. He also found problems with cognitive development and quality of instruction in schools. Other factors, according to Lancy, contributing to the low standard of Mathematics are: the short duration of contact with the Western-style education; the combination of expanding enrolments and declining resources; and the amount of time given for the instruction of Mathematics in the schools.

As a result of these factors, there is a high drop-out and failure rate in Mathematics-based courses at UPNG and Papua New Guinea University of Technology (PNGUT). One-third of the Science Foundation Year students leave at the end of first year and a similar number before the completion of their degrees at these two institutions (Bacchus et al, 1985:81).

When it comes to distance education, the situation becomes even worse due to the non-contiguous mode of instruction (Holmberg 1982). Not only in Papua New Guinea but also in developed countries the attrition rate in Mathematics courses for DLs is much higher. Thus Burt (1979) reports a drop-out rate of 64 per-cent in the Foundation Mathematics course in the British Open University. The majority of Papua New Guinean mature age face-to-face learners are not only seen dropping out of Mathematics courses, but also their performance has been noted to be the lowest compared to their counterparts at PNGUT (Clarkson and Whippy 1981).

The Objectives of the Study

The motive of this study was the concern to improve mathematical performance of matriculates at UPNG. The material used in the paper derives in the main, from a comprehensive research programme conducted at UPNG for the degree of Doctor of Philosophy. The paper does not discuss the research programme in detail, but draws selectively on it to summarise the general findings.

Previous Work in this Field

There are a number of investigations which studied the effect of different variables on students' Mathematics performance in Papua New Guinea as well as in other countries. The studies relevant to this paper are reviewed later.

Studies on Socio-Economic Status

In Papua New Guinea, Tuppen (1981) studied the relationship between the fathers' occupations and education, and the students' assessments. Students whose fathers had education and a high status job did better than others. Fathers' level of education showed the most significant differences on a number of assessment and test variables. Fathers' occupation correlated significantly with pscyhological tests, but not with subject scores in the Mid-Year Rating Examination (MYRE). (According to this method of examining the Grade 10 internal assessments of students were scaled according to their school's result on a national MYRE or School Certificate.) At the end of the year School Certificate Examination results were combined with their other internal assessments (Tuppen 1981:11). This examination method was replaced with a norm-based examination system in 1983.

Tuppen also examined the relationship of mothers' education to students' performance. The students' whose mothers had some education did worse on Grade 8 Mathematics than those whose mothers had no education, but they did significantly better on MYRE science and two psychological tests. Fathers' education seemed a better predictor than mothers' education.

Correlation between socio-economic status measures and academic achievement varying from 0.1 to 0.8 have been reported by various studies in other countries (White 1982:643). When students are used as units of study the relationship between socio-economic status measures and achievement tends to drop with age. This happens due to the equalising experiences provided by socialising agencies, such as school, radio and TV as students grow older (Moses 1978:73). Secondly, a disproportionate number of lower achieving students drop out of school in the higher grades, thus reducing the variance in achievement and correspondingly the magnitude of the correlation (White 1982:469).

Studies on Entry Style

In Papua New Guinea there are a number of studies which have attempted to investigate the relationship of one or more of the variables: Grade 10 grade in Mathematics, arithmetic ability scores, attitudes towards Mathematics and mature students' work experience to mathematics performance at MS and tertiary level. Clarkson (1982) found Grade 10 grades in Mathematics poorly associated with students' performance in Grade 11 Mathematics. One of the main reasons for this poor relationship given by him is the method of assessment. Students' Grade 10 grade was determined by using the MYRE.

Bridger (1986) used results of two arithmetic ability tests (D2 and A4) conducted by Ros (1983) to predict students' performance in Grade 12 Major and Minor Mathematics. He found that these tests have extremely low predictive validity. Among others, the main reason mentioned by him for such a situation was different conditions under which these tests were conducted in different schools.

In PNGUT Foundation Year mature students' attitudes towards Mathematics and achievement were the lowest of all groups of students (Clarkson and Whippy 1981:28). Clarkson and Whippy (1981) and Kaeley (1982) investigated the effect of mature students' work experience on their mathematics performance at Foundation Year level at PNGUT and UPNG, respectively. The majority of the students of both the studies thought that their work experience would help them in learning Mathematics.

In other countries some researchers have found attitudes affecting achievement (Fennema and Sherman 1976; Kulkarni et al, 1969, Lindgren et al 1964:45; Schofield 1982). However, Cockcroft (1983:61) in the *Review of Research* suggests that the relationship between the two is not clearly established. Neale (1969:632) from the First International Study on Mathematics also shows that attitudes appear to be independent of mathematics achievement.

Edge and Friedberg's (1984) investigation studied the influence of a range of pre-university mathematics scores on performance in the first semester of Calculus at the Illinois State University. They found algebra pre-test scores and the high school rank best related to performance in Calculus. Edwards (1972) showed that 71 percent overall variance in remedial mathematics course performance in the Public Junior Community College in the USA was explained on the basis of high school average, mathematics test score, attitude toward mathematics score, sentence test score and mathematics interest score.

In other countries mature students' performance in Mathematics in the light of mathematical experiences gained during the break in studies has been investigated by Eaton (1980), Hubbard (1982), Kaeley (1976, 1979) and McIntosh and Morrison (1974). Their findings sugest that mature age entrants who acquired mathematical experiences during the break in studies are likely to perform better in mathematics compared to other adult learners.

Studies on Instructional Variables

Among variables studied on instruction and mathematics performance in face-to-face and distance teaching were tutor helpfulness, clarity of study material and students' homework.

The nature of the relationship between tutor and individual students emerged as an important element in the teaching and learning process in face-to-face instruction in Australia (Keeves, 1972:242) and in distance teaching in the United Kingdom (Harris 1975:43). In the latter study it was also seen that to a certain extent the 'better' the correspondence course the more effective the 'good' tutor. Kaeley (1989) found similar relationship existing between tutor helpfulness and mathematics performance of mature internal and external students of UPNG.

In both instructional modes, homework done by the students contributes to their mathematics performance. Thus at UPNG, Kaeley (1989) noted a direct relationship between mathematics performance and self-test exercises attempted and assignments submitted by the internal and external students. Keeves (1972:24) quoting research from England shows that homework, followed by maturity of the teaching staff were major factors contributing to change in mathematics performance of primary school children. From a United States study on DLs, Childs (1966:137) showed direct relationship between test papers handed over for marking and

(1966:137) showed direct relationship between test papers handed over for marking and corrections and achievement in the final examination. Hartung (1967:188) from the First International Study on Mathematics Achievement shows a similar relationship between homework and achievement in three of the four populations.

The author has not found any studies, especially in third world countries, investigating the relationship of mature students mathematics performance to socio-economic status, entry style and instructional variables.

Methodology

Seven instruments were used in this study. They included: initial information questionnaires and final information questionnaires for internal and external students which were specifically developed for this investigation. They were pretested on the 1983 intakes of PY and MS students and were modified in the light of their responses. In addition, Arithmetic Ability D2 Test was taken from Goroka Teachers' College and Clarkson and Whippy (1980) Attitudinal Scales from PNGUT. The latter were modified, enlarged and split into attitudinal Scales 1 and 2. They were on the five point Likert Scale: 'strongly agree', 'agree', 'undecided', 'disagree', 'strongly disagree'.

The questionnaires were administered to internal students during regular class time and to external students during one of their weekly tutorials. This personal approach had several advantages over postal administration. The response rate was high. Thus out of 166 DLs, 90.4 percent, out of 142 NSLs, 82.4 percent, and out of 329 SLs, 90.6 percent responded to the initial questionnaires. For final questionnaires the response rate was 88 percent from DLs (n=100), 86 percent from NSLs (n=112), and 90.6 percent from SLs (n=32). This increased the validity and reliability of the survey, giving weaker students a chance to reply, thus offsetting the bias of brighter students who tend to dominate replies to questionnaires administered by post.

The Results

The relationship between the dependent variables Achievements 1 and 2 and three groups of independent variables mentioned in the beginning of this paper is studied in two different ways. In the first place, coefficient of correlations with Achievements 1 and 2 of the variables of each group are studied and described. In the second place by applying multiple linear regression analysis the contribution of each group of variables to variation in mathematics performance is investigated. Finally the effect of two sets of variables; that is, socio-economic status variables and entry style variables on Achievement 1 and of three groups; that is, socio-economic status variables, entry style variables and instructional variables on Achievement 2 is determined. The influence of instructional variables on Achievement 1 is not investigated as the data on the variables of this group were not collected in the middle of the year. The results are reported later.

Effect of Socio-Economic Status Variables on Mathematics Performance

In the initial information questionnaires the students were asked questions on their parents' educational and occupational status and language mostly spoken at their homes. From this information the following socio-economic status variables are taken: father's schooling (FSCH), father's job (FJOB), mother's schooling (MSCH) and language mostly spoken at home (LANG).

Table 1 shows the association between students' father's schooling, father's job, mother's schooling, langauge mostly spoken at home and their mathematics Achievements 1 and 2 scores.

Table 1: Correlation between mathematics achievement and FSCH, FJOB, MSCH and LANG

Variable	Achievement 1			Achievement 2		
	DLs	NSLs	SLs	DLs	NSLs	SLsF
SCH **	.00	.10	.31	.17	.13	.17
FJOB	.00	.10	.08	.10	.05	-.10
MSCH **	.02	-.02	.28	.03	**-.20**	.29
LANG ***	.13	.16	-.13	.18	.15	**-.44**

These variables were converted to ordinal data in the following way:

* Paid job = 4, earned money in the village = 3, subsistence farmer = 2, no job= 1
** More than primary = 4, primary = 3, incomplete primary = 2, no schooling = 1

*** English = 4, Pidgin = 3, Motu = 2, Tok Ples = 1

Correlations significant at the 0.05 level are printed in bold. The same pattern of printing correlations significant at the 0.05 level in bold will be followed throughout this paper. The correlations between father's schooling, father's job, mother's schooling, langauge mostly spoken at home and both Achievements 1 and 2 for all individual samples except NSLs for mother's schooling with Achievement 2 and SLs language mostly spoken at home with Achievement 2 were non-significant. This was so because the samples were homogeneous in other variables. Both these correlations were negative. For the NSLs this means the children of uneducated mothers had better performance in Mathematics over the whole year than their counterparts who had educated mothers. This result is similar to Tuppen's (1981) Grade 8 students, where the children of educated mothers obtained lower scores in Mathematics compared to the siblings of uneducated mothers. It is difficult to give explanation to this result. In the case of language mostly spoken at home the negative sign of the correlation shows that the SLs who spoke English or Pidgin at home had lower scores in Mathematics than Tok Ples and Motu speakers. The possible reason is that the majority of the members of this sample were from Highlands region. The English and Pidgin speakers were from the minority of the students who were from other parts of the country. Among highlanders by chance there were a number of bright students who spoke Tok Ples at home, as their parents were comparatively less educated than the parents of other students, but obtained high scores in Mathematics.

The association between Achievements 1 and 2 scores and socio-economic status measures already discussed for mature students (DLs and NSLs) was especially low. This is possibly because of a decline in the relationship between socio-economic status and achievement due to age as shown in the review of literature in the beginning of this paper.

Entry Style and Mathematics Achievement

The entry style variables are obtained in the following way. Grade 10 grade (G10G) in Mathematics was taken from the records office. Arithmetic ability scores (ARAB) and attitudes toward Mathematics scores (ATTM) were obtained from Arithmetic Ability Pre-test and Attitudinal Scales 1, which were administered to the students in the beginning of the course. Mathematical experiences (MAEX) were defined by taking into account students' work experience and Mathematics courses attended after completing Grade 10. This information was obtained from students' initial information questionnaires. Grade 10 letter grades were converted into points, on the following basis: D=4, C=3, UP=2, P=1, F=0.

Table 2 shows relationship between Grade 10 grade, arithmetic ability, attitudes toward Mathematics, and mathematical experiences and Achievements 1 and 2 scores for all the three samples. All correlations except mathematical experiences with Achievement 2 for DLs and Grade 10 grade and attitudes towards Mathematics with Achievements 1 and 2 for SLs are significant at least at the 0.05 level. Correlations between attitudes towards Mathematics and Achievements 1 and 2 scores for SLs are particularly low.

Table 2: Correlations between Mathematics Achievement and G10G in Mathematics, ARAB, ATTM and MAEX

	Achievement 1			Achievement 2		
	DLs	NSLs	SLs	DLS	NSLs	SLs
G1OG	.30	.30	.24	.44	.24	.36
ARAB	.60	.64	.41	.57	.49	.53
ATTM	.36	.23	-.05	.31	.28	-.08
MAEX	.34	.23	N/A	.15	.26	N/A*

* N/A means not applicable.

The association of SLs Grade 10 grade with Achievements 1 and 2 scores not reaching significance was not an expected result, as they came straight from school. Their mathematical skills would have not deteriorated in the same way as the skills of mature students, who had at least a year's break in studies. Furthermore they had sat for the new Grade 10 examination, supposedly an improvement on the old MYRE. Perhaps this unexpected result for SLs was due to the homogeneous nature of the sample as they had grades C and D only.

The association between attitudes toward Mathematics and Achievements 1 and 2 scores for SLs supports the general trend shown in the review of literature. It could be that the SLs were younger and straight from school. They were probably under pressure from their parents and teachers to do well in Mathematics. This could have helped them to attain high scores, but led to the development of negative attitudes towards mathematics.

In this group of variables, arithmetic ability has shown the highest association with Achievements 1 and 2 scores. This is better even than the Grade 10 result. This is for two reasons. First the Arithmetic Ability Pre-test judged students' backgrounds at the time when they were startng the course. This was not the case for Grade 10 grade in Mathematics for DLs and NSLs who had obtained this grade years ago. In the intervening period, some of the students may have learnt more Mathematics through different means. Others may have forgotten it due to disuse, which would not be shown by the Grade 10 result. The Arithmetic Ability Pre-test scores took most of the things into account and therefore showed a better relationship with Mathematics achievement of mature students. Secondly, the Grade 10 result in mathematics and attitudes toward the subject are less strong predictors of students' performance at tertiary level Mathematics in Papua New Guinea, as mentioned in the review of research in this paper.

Instructional Variables and Mathematics Overall Performance

In the final information questionnaires, the students were asked questions on the instructional variables which incuded clarity of study material (CSM), proportion of self-test exercises attempted (SET), number of assignments submitted for marking (ASS) and tutor helpfulness (TUT).

Table 3: Correlation between Mathematics Achievement 2 and CSM, SET, ASS and TUT

Variable	DLS	NSLs	SLs
CSM *	.24	.24	.10
SET **	.25	.23	.08
ASS ***	.25	.14	.16
TUT ****	.32	.40	.08

These variables were converted to ordinal data in the following way:

* Always clear = 3, sometimes clear = 2, confusing = 1
** All or almost all = 4, three quarters = 3, half = 2, quarter or less = 1
*** All = 2, not all = 1
**** Most helpful = 3, helpful = 2, not helpful = 1

All the correlations for DLs and NSLs except number of assignments submitted for NSLs are significant. All the correlations for SLs are non-significant. One of the reasons for this non-significant correlations for SLs is that this sample was homogeneous in all these variables. This is so because the majority of them found the study material clear and the tutors most helpful in their studies. All of them attempted almost all self-test exercises and submitted all assignments for marking. This was in turn due to their better educational background, as all of them have either D or C grades in their Grade 10 Mathematics.

For the non-significance of the relationship between number of assignments submitted and Achievement 2 for NSLs, the same type of reason given for SLs in the above paragraph applies, as all of them except three students submitted all assignments for marking.

All other correlations for DLs and NSLs are positive and significant but not very high in magnitude. For both of these samples the correlation between tutor helpfulness and Achievement 2 are the highest. This means the mature students (DLs and NSLs) who found their tutors most helpful in their studies performed better in Mathematics compared to their counterparts who did not consider them so. This result supports the findings of other researchers reviewed in this paper earlier.

The Regresssion Analysis

In the results discussed so far the association of variables of individual groups with achievement 1 and 2 is discussed. In this section first the contribution of each group of variables to change in Mathematics performance, then of two groups to achievement 1 and finally of all the three groups to achievement 2 is reported. This is achieved by applying 'multiple linear regression analysis' programme 2R of BMDP 85. The results are shown in Table 4.

Table 4: Achievements 1 and 2 Percentage of Variance Accounted for (100 x R^2).

	Achievement 1			Achievement 2		
	DLs	NSLs	SLs	DLs	NSLs	SLs
SESV	2.0	4.6	44.3	6.1	4.5	51.5
ESV	49.4	47.8	37.3	42.2	27.7	35.1
INV	N/A*	N/A	N/A	17.5	21.8	5.0
SESV + ESV	51.1	50.8	53.4	-	-	-
SESV + ESV + INV	-	-	-	57.4	43.2	74.1

* N/A means not applicable

The first row of the table shows that socio-economic status variables are contributing significantly to Achievements 1 and 2 in the case of SLs only. This is so because this sample was highly heterogeneous on these variables as their parents ranged from highly educated professionals to uneducated subsistence farmers. There is a very small contribution to Mathematics performance by this group of variables for mature students (DLs+NSLs). This is due to the following two reasons. Firstly, the majority of the parents of mature students were uneducated and subsistence farmers, thus making these two samples homogeneous in these variables. Secondly, the relationship between socio-economic status measures and achievement tends to drop with age as discussed in the review of literature in the beginning of this paper.

The second row shows that the entry style variables accounted for significant variation to Achievements 1 and 2 for all the three samples, which supports the enrichment theory of education. The highest contribution to variation both in Achievements 1 and 2 is for DLs, because this sample was much more heterogeneous in these variables compared to the other two samples. DLs's Grade 10 grade in Mathematics varied for F to D, arithmetic ability scores from 4 to 50 and attitude scores form 18 to 90.

Row three shows the variance contributed to Achievement 2 by the instructional variables. This is lowest for SLs, as this sample was homogeneous in these variables as discussed under correlations earlier.

The fourth row shows the variation accounted for Achievement 1 by the group of socio-economic status and entry style variables. This is over 50 percent in all the three cases.

In the fifth row of the table the assigned variation to Achievement 2 by all the three groups of variables for each sample is shown. This varies from 43.2 percent for NSLs to 74.1 percent for SLs.

There are eight variables in the fourth row and 12 variables in the fifth row which are contributing to variation in Achievements 1 and 2, respectively. There number can be narrowed down at very small cost of variation by 'all possible subsets regression analysis' programme 9R of BMDP 85, which is not reported here.

Conclusion

As the students in the three samples have different backgrounds, the association between three groups of variables and their Mathematics performance showed varying results. It is only the Arithmetic Ability Pre-test scores from the group of entry style variables which was highly correlated to Mathematics performance of all the three samples. Socio-economic status variables gave considerable correlations with Mathematics achievement for SLs and not for mature students (DLs and NSLs). On the other hand instructional variables showed just the reverse, as their relationship for SLs with overall Mathematics performance was negligible, while that of mature students was significant.

Over 50 percent of variance in Mathematics performance in all the three samples can be predicted on the basis of socio-economic status and entry style variables. The prediction of overall Mathematics performance based on socio-economic status, entry style and instructional variables shows much more variation. It ranges from 43.2 percent for NSLs to 74.1 percent for SLs.

One result from this study has come out more clearly that the students' Mathematics performance depends more on their entry style-mature students versus SLs, that is rather than on their mode of instruction (distance versus face-to-face), as the performance of NSLs was closer to that of DLs as opposed to SLs. This result has been shown in an earlier paper (Kaeley 1988).

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THE ECONOMICS OF DISTANCE EDUCATION

Gerard Guthrie

A common feature of the education systems of 'developing' countries in the 1970s and 1980s has been the growth of distance education, particularly at tertiary level. This growth over the last 15 or 20 years has been such that a considerable literature on the subject has now been developed drawing on all parts of the Third World (Young, Perraton, Jenkins and Dodds 1980; Kaye and Rumble 1981; Perraton 1981; Brophy and Dudley 1982; Rumble and Harry 1982; Crookes 1983; Sewart, Keegan and Holmberg 1983). In many countries, growth has been partly a result of the influence of the Open University in the United Kingdom, but the influence of Australia and New Zealand, in particular, has meant that distance education has a longer history in many parts of the South Pacific. Many New Zealand and Australian secondary and tertiary correspondence courses have been used in the Pacific and, notably, Australian colonial influence left two well-established distance education centres in Papua New Guinea. The secondary level College of Distance Education (CODE), which was established in the early 1970s, now has around 20,000 enrolments a year; the other centre is the Extension Studies Department of the University of Papua New Guinea which now has nearly 5,000 enrolments per year.

Distance education has a number of attractions for Papua New Guinea, as with other South Pacific countries. All countries have small population numbers, often at low densities, and some have these populations spread over very far distances. Add shortages of finance and of trained educationists, particularly at higher levels of the education systems, and the advantages of centralising training facilities in distance units appear obvious. These attractions include access to greater curriculum resources, thus drawing on a wide range of teaching materials and technologies.

Rapid improvements in technology, from word-processing, computer-based instruction, printing, radio, video and television to satellite tele-conferencing, are continuously having implications for distance education (Percival and Ellington 1981; Wagner 1982; Bates 1984). These technologies will have their attractions in overcoming the major handicaps facing communications in Papua New Guinea. However, educational and technological enthusiasms will need to be properly cautioned by economic realities. How expensive are the new technologies to install? What maintenance implications do they have? Can they be serviced locally? Are there enough potential students to justify their costs? Are appropriate teaching materials available at low cost? Such economic questions are important to Papua New Guinea, not only because the establishment costs are high, but also because of high long-term recurrent costs.

In this paper I will outline a number of issues associated with the economics of distance education. Firstly, I will briefly outline the main international findings on the topic which are relevant to Papua New Guinea. Secondly, I will define some basic economic concepts around which such findings revolve. Thirdly, recent research on this topic from other developing countries will be summarised. The analysis will show that distance education programmes need to pay particular attention to the costs of writing courses; to the costs of supply, operation and maintenance of technology for communicating course information; and to the numbers of students enrolled.

Findings on Distance Education Costs

There is a considerable body of literature on the economics of distance education, especially by Rumble (1981, 1982, 1983, 1987), Kaye and Rumble (1981) and Perraton (1982). Unlike many educational issues, findings have not been controversial (Guthrie 1985: 88):

1. The costs of physical and administrative establishment can be high, particularly if new, single-purpose distance institutions are established. But often these costs are absorbed into existing conventional institutions, turning them into mixed-mode internal and external operators.

2. Course development costs are high regardless of the number of students. Essentially these are fixed costs to be written off over the life of a course.

3. Unit costs decrease rapidly as enrolments increase because the teaching is not usually labour intensive. This decrease in costs is one major potential economic advantage over conventional teaching institutions where both course development and teaching entail labour-intensive recurrent costs.

4. Costs are heavily affected by the nature of the media used, the distribution of the media, the extent of face-to-face tuition, and the extent of provision of courses for small numbers of students.

5. A major area of potential cost-savings lies in opportunity costs (the direct and indirect costs to students and employers'. Savings may accrue both to students who do not have to face loss of income during study, and to employers not required to find substitute workers.

Rumble and Keegan (1982: 220) conclude that,

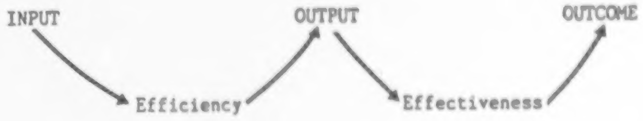
> ...in general, conventional teaching systems are cheaper for low number of students, while distance teaching systems are cheaper for high numbers of students ... their cost advantage can be undermined if .. the investment in media and materials is excessive, relative to the number of students in the system.

Efficiency and Effectiveness

While instructional design often is taken to connote preparation of materials, Gagne and Briggs (1979: 23-39) take a wider perspective with implications for the present analysis. They define a fourteen step model. The first three steps are: analysis of needs, goals and priorities; analysis of resources, constraints and alternative delivery systems; and determination of scope and sequence of curriculum and courses, including delivery system design. Only then are we ready to begin designing courses and materials. Prior to this, there is a clear need to decide as objectively as possible whether the system of instruction which is proposed will actually meet the real needs and provide the desired outcomes. What are the real needs? What alternative forms of training technology will be best? Are the desired systems economical? Is there a cheaper way of achieving the same effect? In other words, the first three steps all involve economic considerations.

The economics of distance education revolve around questions of cost-efficiency and cost-effectiveness. As Figure 1 shows, efficiency concerns the quantitative relationship between inputs and outputs (PSB 1986: 14). Basically it is concerned with whether given outputs are produced as cheaply as possible. Here inputs might be the human, capital and financial resources required to establish new distance education programmes. Outputs might be the number of people trained as a result of the projects. Cost-effectiveness, on the other hand, is concerned with the quantitative and qualitative relationship between outputs and outcomes: whether the outputs of a programme achieve the desired educational outcomes, again as economically as possible. For example, cost-effectiveness would involve consideration of whether the graduates of a programme were effectively applying their training to a particular work situation, and whether this was achieved at less cost than an alternative educational approach.

Figure 1:The relationship between efficiency and effectiveness



Cost-efficient programmes are not necessarily cost-effective. Figure 2 shows the interaction between costs and effectiveness for two projects, A and B (Harrold 1982: 272). Cost is represented along the horizontal axis, effectiveness along the vertical. Cell 2, for example, considers a case where Project A is equally as efficient as Project B, but is more effective. Project A is therefore the preferred alternative. Where projects are equally effective, the less costly one is preferred (cells 4 and 6). Where projects cost the same, the more effective one is preferred (cells 2 and 8). The most desirable situation is one where a project is both cheaper and more effective (cells 3 and 7).

Figure 2:Interaction between costs and effectiveness

Cost

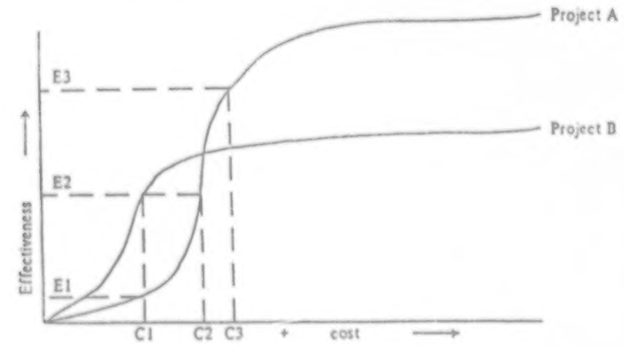
	A > B	A = B	A < B
A > B	1 ?	2 A	3 A
A = B	4 B	5 A or B	6 A
A < B	7 B	8 B	9 ?

Effectiveness

The most common situation, however, is that the more expensive project is also the more effective (cells 1 and 9). In this case the preferred approach is to set a desired level of either cost or effectiveness and choose which alternative meets the established standard, as Figure 3 shows (Harrold 1982: 274). In this figure we see that for a given cost (C1), Project B is more effective (its level of effectiveness, E2, is greater than for Project A, E1). The graph shows that where we set lower cost standard (C1 and C2), Project B is the more effective. But if we are prepared to tolerate higher costs, Project A becomes more effective. In other words, Project B is cheap to establish but in the long run achieves lesser outcomes; Project A is expensive to establish but later gains considerably in effectiveness as a result of relatively small increases in costs.

An example relevant to Papua New Guinea would be an attempt to make increased use of distance education to provide further training for teachers in schools. The outputs of such a programme might be the number of teachers successfully completing higher qualifications. Cost-efficiency would involve attempting to produce the graduates at as low a unit cost as possible. The planned outcome, the long term training objective, would be to improve the quality of classroom teaching. Cost-effectivenss would therefore be concerned with whether the graduates successfully applied their teaching skills and whether the improvement, if there is one, could have been more economically gained through alternative, perhaps more conventional, training approaches.

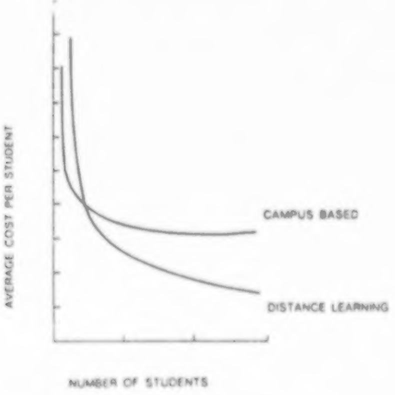
Figure 3: Effects of specifying aceptable costs and effectiveness



The relevance of this type of analysis is that we need to weigh the value of alternative approaches if we are interested in rationally using scarce financial resources to full educational advantage. Will distance education be more cost-effective than conventional education? Would distance education programmes relying on audio-visual material transmitted by satellite be more effective than traditional programmes transmitting written materials by post or by fax? If so, is one type of satellite usage cheaper than others?

In general, the findings on the cost-efficiency of distance education compared to conventional education are that conventional education systems are cheaper for small numbers of students, but that distance education will tend to be cheaper for larger numbers of students, as Figure 4 shows (based on Kaye and Rumble 1981:232). Both conventional and distance education have fixed administrative costs which mean that the cost per student is high when there are low student numbers. However, the unit cost of course and materials preparation in conventional education is basically constant regardless of the number of students, hence campus-based unit costs in Figure 4 soon flatten. This is because it is normal in these campus-based institutions for teachers to prepare their own materials while they actively proceed with teaching. There are usually acceptable student-teacher ratios and, as the number of students increases, the number of teachers increases in direct proportion. Unit costs of courses therefore stay fairly constant. Distance education, however, usually requires a considerable amount of preparation of course material prior to the enrolment of students, thus Figure 4 shows higher initial costs per student. However, after students are enrolled the extent of face-to-face contact is less than in conventional institutions, and therefore the cost of the actual teaching is lower. It follows that the more students who are enrolled the lower the unit costs will become.

Figure 4: Costs of distance versus conventional education



There is thus a considerable potential for distance education to provide economies of scale but, as Rumble (1987: 75) puts it,

> If economies of scale are an objective, you must be sure that you will have sufficient students ... in your system, thus bringing average costs down to a level at which economies of scale begin to be reaped.

The gap between campus and distance education costs in Figure 4 appears attractive, but the reality is less attractive (though nonetheless favourable) because, typically, distance education institutions have lower rates of completion. The gap between distance education and conventional institution costs lessens if completion rates are considered instead of enrolments.

The number of students required to make distance education courses more cost-efficient than conventional courses varies in part with the level of education being provided. Rumble (1982) says that, for full-scale distance education universities to be cost-efficient compared to conventional universities, some 20,000 full-time equivalent students are need each year. I am aware of no other similar types of statement for primary, secondary, or technical education, although the unit cost of enrolments in the Papua New Guinea College of Distance Education was K187 for 2,255 full-time student equivalents compared to K357 for 41,702 provincial high school enrolments in 1983 (NPO 1984: 121, 61), but the rate of CODE completion is much lower. The implication in principle is that if distance education is to be economically used, it should concentrate upon the provision of courses where student enrolments will be highest. Other implications are drawn out in some detail by Rumble (1987).

There are five major qualifications to this analysis:

1. The cost of establishing distance education courses can be lowered if mixed-mode internal-external institutions adapt courses from existing conventional courses, as is possible when `externalising' existing internal University of Papua New Guinea courses.

2. Costs are heavily dependent on media. The simple print media typically used in Papua New Guinea are much more economical than expensive high technology systems, although some non-print options such as audio cassettes can be very cheap as well.

3. The costs of distance education are heavily dependent on the extent of face-to-face contact provided as part of the programme. The more it is wished to provide face-to-face tutorial assistance, such as with provincial centres, the greater the costs will be and the larger the numbers of students needed to justify the costs.

4. However, cost comparisons with conventional institutions may be unwarranted if it is impossible to educate through conventional methods. In situations where distance education is the only practical possibility (such as inability to bring working students on outer islands to central institutions in Port Moresby for long periods of time) then questions of cost-effectiveness can only relate to the benefits of the educational investment compared to the benefits of investment in alternative forms of development (for example, health or transport).

5. Conventionally, project cost-analysis compares the cost-benefits to the internal rate of return in a country on investment capital (typically) measured against bank interest rates. Where the returns from investment in either distance education or conventional education are below the internal rate of return, there is little economic reason to invest in either, although non-economic reasons may prevail.

Major Aspects of Costs

The actual costing of education involves a number of components (Rumble 1983). Two major ones are fixed costs and variable costs. Fixed costs are costs which are incurred irrespective of the numbers of students in the system. In essence for distance education these involve administrative overheads plus the preparation of distance courses and materials. Variable costs directly relate to the number of students. As already noted, in conventional education institutions a major component of variable costs is teacher time and costs. In distance education institutions the main component of variable costs are the actual production of materials and the establishment, running and maintenance costs of the media used for presenting the course to students. The high fixed cost of course preparation in the distance education situation explains why the initial costs are higher than in conventional institutions (although, as also noted, they can be lowered in mixed mode institutions if existing internal courses are adapted for external teaching). The lower variable costs with distance education (because of materials production rather than classroom teaching) explain why the costs rapidly reduce once student numbers increase. Thus, over time, the average cost (unit cost) of students decreases in distance education, even though the total costs may increase.

The actual way of calculating fixed and variable costs differs from institution to institution, depending upon the nature of the courses and media (see for example, Rumble 1981; 1982). It is beyond the scope of this paper to analyse in detail the costs of the various media and how they contribute to fixed and variable costs, but Perraton (1982) does contain further information on this. In general, design and production costs are much higher than the costs of transmission and reception.

Both fixed and variable costs are usually lower for print media than they are for radio, and radio costs are lower than for television. The more complicated media tend to offer the greatest economies of scale, but Rumble (1983: 429) says that,

> ...as a general rule, the 'little media' (that is, those requiring simple, inexpensive equipment such as slide projectors and tape-recorders) offer far greater cost advantages than the 'big media' (such as television and computer-based instruction) where small audiences are concerned, but their relative advantage diminishes subsequently. Radio, however, keeps a relative advantage over the big media; whatever the audience size.

A third major cost component of education is hidden costs. Some of these hidden costs may occur when the physical and administrative establishment costs of a distance education programme are carried by existing conventional institutions. However, if new distance education colleges are started these costs may be high and identifiable, and no longer considered as hidden costs.

A major area of hidden costs is opportunity costs, which are the direct and indirect costs to students and employers of having students participate in an education programme. Compared to full-time savings in conventional programmes, distance education offers major savings in opportunity costs where the students are mid-career professionals (such as teachers) undertaking a form of inservice training. Where students do not have to forego earnings in order to attend a conventional course, or where employers do not have to pay them a salary to do this or do not have to obtain replacement employees, the savings in opportunity costs involved in distance education courses may be very high indeed.

Current Research Studies in Developing Countries

It will be useful now to turn to some examples of actual research to see how they support the theoretical principles already outlined. While Papua New Guinea and Pacific area have long had involvement in distance education, there are very few empirical research studies which appear to be available. Regionally produced journals like *Directions, Distance Education*, the *Papua New Guinea Journal of Education*, and the *South Pacific Journal of Teacher Education* rarely publish material on distance education in the Pacific. When they do, it is either not on economics or media, (for example, Kember 1980; and Lipscombe 1985, on the social background of UPNG and CODE students) or it is professional comment and description of programmes rather than empirical research (for example, Reddy 1979, on educational radio in the South Pacific; Field 1981, describing CODE). An exception to the availability of research are articles on the University of the South Pacific (USP) satellite system (for example, Unesco 1985:81-92; Williams and Gillard 1986).

Most available cost-efficiency studies in distance education are of the Open University in the United Kingdom, although among recent research there are a few studies on institutions in developing countries outside the Pacific area. The first three studies summarised here provide evidence supportive of the first four points summarised in the first section, but none have empirical data on opportunity costs. Rumble (1981;1982) provides a pair of detailed studies on two similar independent distance education universities in Costa Rica and Venezuela. Taylor (1983) reviews findings on two programmes for upgrading primary teachers in Bophuthatswana and Lesotho. That all these distance education programmes were newly established may explain the main empirical finding in common: their cost-efficiency was comparable with that of similar conventional programmes, but none had managed to enrol sufficient numbers of students to take advantage of their potential economies of scale. In the fourth study, Biniakunu (1982) shows that simple correspondence programmes can be effective in teacher inservice.

Rumble (1981) examined the cost of distance teaching at Costa Rica's Universidad Estatal a Distancia (UNED). The university was established in 1977 to increase university enrolments in Costa Rica, especially among those unable to enrol in campus-based study. UNED is wholly based on distance teaching and offers a range of formal professional diploma and degree programmes, as well as non-credit extension courses. Rumble pointed out that cost analysis can identify the main cost-inducing variables in a system, relate these to units of output, and predict costs of alternative plans. He presented the development of a cost function for UNED in some detail, and provided current (1980) and projected costs.

The main findings from the cost analysis were that:

(a) Cost-efficiency was comparable to established conventional universities. The average cost per student credit was very similar to that in the oldest and largest of the conventional universities in Costa Rica and about half that of a newer, smaller university.

(b) In 1980, with 8,148 full-year-equivalent (FYE) students, average per-student cost was $795. Planned expansion to 19,769 FYE students in 1985 would reduce average per-student cost to $696 despite a budget increase of 212%.

(c) The proportion of total expenditure spent on overheads would drop from 45% in 1980 to 28% in 1985 as establishment costs were completed.

(d) The proportion of total expenditure on production and maintenance of course materials would decline from 15% in 1980 to two percent in 1985, providing a large-scale increase in new courses did not occur.

(e) A change of emphasis from print materials would see audio-visual and broadcasting costs increase from 4% of the 1980 budget to 22% in 1985.

The overall judgement was that UNED did not currently have significant cost advantages over established conventional universities, but it had potential for achieving greater economies of scale if student enrolments increased.

A second study by Rumble (1982) looked at Venezuela's Universidad Nacional Abierta (UNA), a distance teaching university established in 1977. It offers multi-media diploma and degree courses in a number of professional areas. Rumble used a procedure similar to that of his previous study, although operational definitions varied and prevent direct comparisions of expenditure patterns. No cost comparisons with other universities were provided. The main findings on student costs were that:

(a) Average FYE costs with 13,357 students in 1980 were US$1,560.

(b) Existing plans for a steady state university by 1985 would see a decrease to 11,650 FYE students in 1985 at an average FYE cost of $1,955.

(c) Costs would fall to $1,217, however, if enrolments were increased to 20,000.

(d) Like UNED, UNA was at a critical stage of its development where small increases in enrolments would significantly add to cost-efficiency through economies of scale, but decreased enrolments would cause rapid increases in unit costs.

The study illustrated the crucial importance of three variables affecting the costs of distance education: choice of media, size of the academic programme, and number of students. Distance education is not necessarily a cheap way of teaching and, unless enrolment is over 20,000 FYE students, distance teaching universities of this type are not likely to be able to offer both a full range of academic programmes and specialised subject studies.

Taylor (1983) reported findings on the cost-effectiveness of two inservice distance education programmes for upgrading primary teachers in southern Africa. The Bophuthatswana Teacher Upgrading Project (BTUP) was a privately funded, independent unit which operated from 1973 to 1977. It focused on academic courses leading to general secondary-level certificates, using print materials, and emphasising group study among student. The Lesotho In-Service Education for Teachers (LIET) scheme is based in a preservice primary teachers' college. It provides both academic and professional courses leading to professional qualifications and places more emphasis on tutorial teaching. The findings on cost-efficiency were that:

(a) BTUP ran on a low budget with staff salaries representing only 36% of recurrent costs. With an average of 586 students per year in 1976 and 1977 recurrent students costs were 201 Rand per year.

(b) LIET was offered in a teachers' college with higher staffing levels. Salaries accounted for 69% of recurrent costs in 1979-1980. Recurrent costs for 350 students in 1979-1980 were 639 Rand per student.

(c) Both BTUP and LIET had direct recurrent student costs similar, respectively, to those of conventional secondary education and primary teacher training.

(d) Substantial economies of scale could have been achieved with increased enrolments.

Although Taylor (1983) presented no direct data on cost-effectiveness, he claimed there was evidence in both cases that the projects were effective in bringing about success in examinations, acquisition of qualifications and consequent promotion. The report claims that although both programmes had similar cost-efficiency to conventional programmes, it is unlikely that the same degree of effectiveness in reducing the proportion of unqualified teachers could have been achieved by any other inservice education strategy for teachers.

Biniakunu (1982) used a simple experimental study to evaluate the effect on reading achievement of Grade 8 students in Zaire taught by teachers of French who had been provided with inservice training in the teaching of reading. Twenty teachers were equally divided into an experimental group and a control group. All teachers were from rural schools and all were high school graduates who according to Zaire's regulations were unqualified to teach French. The inservice course was taken solely by correspondence and consisted of instruction in types of reading, purposes of reading, the identification of general ideas and specific information, practical application, and critical evaluation. The major findings were:

(a) On a 20 item pre-test of student performance the control group mean (9.45) and experimental group mean (9.41) were not significantly different ($p > .05$).

(b) There was no significant different between control group pre-test and post-test results ($p > .05$).

(c) Effectiveness was shown by a significant improvement in experimental group pre-test and post-test (post-test mean = 11.68, $p < .01$).

The conclusion was that the inservice course was associated with improvement in the reading abilities of the students taught by participating teachers. Although no cost data were presented, the fact that the programme was a simple correspondence one allows the inference to the be drawn that it was cost-effective, at least in relation to the use of more advanced technology.

Conclusion

These research examples provide both some encouragement that distance education can be a viable, cost-efficient and cost-effective alternative to conventional education, and some salutary cautions about the economic pitfalls.

In general, large enrolments provide viable distance programmes and small courses are uneconomic. To maximise enrolments, it is probable in Papua New Guinea that distance education would best provide general education courses in popular demand, such as the high school-leaver courses offered by CODE. These courses are in high demand and efficiently cater for large student numbers. The Waigani campus of the University of Papua New Guinea, on the other hand, may fail to meet this criterion when it provides courses for small groups of students, such as science candidates who are not catered for by conventional university programmes.

The exceptions to situations where large student numbers are economically desirable are those if there are high opportunity costs, particularly when no viable alternatives to distance programmes exist. Here the efforts of the Faculty of Education to externalise inservice training for secondary school teachers are a good example. The opportunity costs of teacher attendance at full-time courses is high because of the high costs associated with providing expatriate substitutes for national teachers undertaking full-time training on-campus. The programmes become viable despite lower enrolments than perhaps desirable.

Costs will particularly increase with certain types of high technology media, with their supply, maintenance and replacement costs. UPNG and CODE have both managed to avoid this pitfall by providing most courses through print media supplemented by low-cost audio-cassette tapes. Should they attempt to introduce high-level technologies associated with television or video, for example, this situation would change.

Costs rapidly increase with the supply of extra tutorial assistance to students. Both CODE and UPNG have provided provincial study centres to assist students in areas outside Port Moresby. While this is intended to lead to higher completion rates, from an economic perspective this could be questionable.

Costs can be offset, however, if establishment costs are minimised through using or modifying existing courses or materials. CODE has this advantage when it builds its secondary-level courses on existing provincial high school syllabuses and UPNG does the same when it builds external courses on internal ones. Such action makes course development costs more viable in the longer term. A further implication is that it is desirable to externalise courses (such as Foundation Year courses) needed by a large number of students in different programmes, in order to maximise enrolments. In contrast, attempts to provide university courses unique to the distance mode or needed by small numbers of specialised students would be a high-cost proposition.

The overall economic perspective is therefore one of cautious optimism.

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DISTANCE EDUCATION, TEXT AND IDEOLOGY IN PAPUA NEW GUINEA

Richard Guy

The purpose of this paper is to stimulate discussion about the ideological foundations of distance education in Papua New Guinea, especially as it relates to text in distance education. I am not so much concerned here about the ideology of the content found in text but rather the ideology which derives from the form of text in distance education. Ideally what is needed to understand this issue in depth is a long-term, theoretically and politically grounded ethnography of text in distance education from its conception and construction through to its use by distance education learners.

Educational Innovations in Papua New Guinea

Guthrie (1986) suggests that the response of education in Papua New Guinea has been to import fashionable educational practices from elsewhere. This is worrying because of the assumption that overseas innovations are appropriate for this country and more importantly, because each innovation brings with it ideological positions which may not be congruent with the social, economic and political conditions prevailing in Papua New Guinea.

This practice has resulted in a number of false starts. The primary science programme of the 1960s was unsuccessful because of the conflict between traditional notions of causality and modern science (Bulmer 1971); the Dienes inspired mathematics programme unsuccessfully promoted student-centred, individual discovery methods in the 1960s (Lancy 1983); the Taba inspired Secondary Schools Social Science syllabus which emphasised independent student learning and a facilitator role for teachers was acclaimed as an 'international front runner' (Cleverley 1975:21) but the spiral approach had to be downplayed in time and the traditional didactic role of the teacher reintroduced because neither teacher nor students could cope with the innovation (Weeks and Guthrie 1984); the move to school-based curriculum development in the 1970s failed because of the lack of initial training given to teachers in curriculum development (Lornie 1982); and the implementation of the 1980s Secondary Schools Community Extension Project required a knowledge background and teaching flexibility that Papua New Guinean teachers did not possess (Crossley 1984).

Of course not all imported practices should be condemned outright but they do require considerable reflection and debate prior to their introduction. These examples illustrate the prevailing ideologies of politicians and educational decision makers at various times and how the education system reflects particular views of society. At the same time these decision makers prefer to enrol their own children in overseas schools or the international schools in Papua New Guinea which provide an academic curriculum and possess superior resources and funding to the state run schools (Bray and Smith 1985).

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Why have so many educational innovations been less than successful in Papua New Guinea? A number of writers suggest that the problem is the uncritical adoption of overseas educational practices which overlook the fundamental character of the context into which these practices are transplanted (Crooks 1983; Flinck and Flinck 1985). Guthrie (1990) contends that the expatriate presence which often initiates innovation in the Third World is withdrawn 'too early' and funding arrangements, which at the trial stage of an innovation may be at a suitable level, are severely reduced at the implementation stage. Other writers argue that Papua New Guinea's community and high school teachers and students are more comfortable working in formal, teacher led classrooms based on traditional values (Larking 1974; Guthrie 1983; McLaughlin 1988) and that Western educational innovations such as discovery learning, creative learning and independent learning approaches are inappropriate (Field 1980; Lancy 1983; Souviney 1981; Vulliamy 1984).

Matane (1986) makes a plea for Papua New Guineans to assess the contextual variables operating in the country and to search for appropriate solutions to educational issues - 'we do not need to rely on foreign education 'experts' or consultants. Let us make more use of our own people who best understand our problems and needs'. Recent reports in Papua New Guinea comment on the decline in standards (Bacchus 1984; Kenehe 1981) and the Matane Report (1986:6) calls for a renewed response to education in Papua New Guinea which 'must aim for integrating and maximising: socialisation, participation, liberation and equality'. Despite this rhetoric the school curriculum continues to be highly centralised and teachers are trained to reproduce the existing social and economic relationships found in society by following explicit teacher syllabus guides (Lornie 1982). Acceptance of the Matane Report by the national government has significant implications for distance education in Papua New Guinea and suggests the need for the reconstruction of not only the rationale and content of distance education materials but as well the very form of these materials which at present may ony serve to limit notions of freedom, participation and liberation.

Distance Education in Papua New Guinea

Distance education has undergone significant growth in the past decade in Papua New Guinea which is an outcome of increasing population growth rates, an increasing demand for formal education and lack of secondary and higher education facilities. The development of distance education has been stimulated by innovations from the developed world and the methodology and rationale of distance education in Papua New Guinea is embedded in the traditions and the socio-economic, political and cultural contexts of the developed world. The growth in distance education in the developed world has arisen, in part, because of technological developments, and claims that this form of education is more cost-effective than conventional forms of education, that it provides equivalent educational opportunities for all groups within society, and has the capability of reaching a large number of people through new communication technologies. Claims such as these are extremely attractive to Papua New Guinean politicians and educational planners who are faced with a largely uneducated population, scarce financial resources and spiralling costs, significant shortages of trained local personnel and stagnant economic growth rates.

The research literature concerning distance education in Papua New Guinea is limited mostly because of the relative 'newness' of distance education. For instance, there are general descriptive statements about the organisation of distance education in Papua New Guinea (Kaeley 1985; Monsell-Davis and Naidu 1989), programme reviews and evaluations (Guy 1987; Meintjes 1987; Shaw 1986; Smith et al.; Wari 1985), comparative studies (Kaeley 1984), student profile information

(Guy 1989a; Kaeley 1980) and 'drop-out' studies (Taylor 1986). The literature tends to be stated in positivistic terms and is driven predominantly by organisational and psychological conceptions of distance education. Ideology is easily discernable in much of this literature and Kaeley (1989:12) suggests that, 'Distance education so far has been used as a handicraft industry to train teachers in Papua New Guinea; it can be really useful for the country if it could be employed in industrial fashion in Peters' sense'. Meintjes (1987:167-168), discussing the selection of content for distance education programmes at the Pacific Adventist College, explains 'compatibility with our ideals and identity... was easy to secure, as we were not actively seeking to confirm that identity but sought rather to excise or explain any overt denial of it'. Crossley (1989:12) expresses a sociological concern for the outcomes of distance education and is concerned that technocratic notions of efficiency and ideological issues may come to dominate distance education in Papua New Guinea at the expense of interactive and reflective learning.

What is largely lacking, even given this short tradition of research, is any significant attempt to question the assumptions that the theory and practice of distance education bring with it in terms of the social and cultural contexts within Papua New Guinea (Guy 1989b). Perraton (1979) raises the matter of traditional learning styles in Third World countries such as group orientation to learning and questions the relevance of the basic individualised approach of distance education. Holtzman (1975) suggests that the research priorities for distance education in the third world may more appropriately lie in recognising that students from Western countries are competitive but students from the Third World are cooperative and seeking to understand the implications of such cultural factors on learning, materials production and retention rates. There is insufficient understanding of the orientation to learning and study, conceptions of learning and the factors that influence learning by distance students in Papua New Guinea (Marton 1984). Nor do we know enough about the function and form of text in distance education (Evans and Nation 1989a). Crossley (1989:22) acknowledges that, 'This is a big challenge, for while the more pragmatic concerns of distance education will continue to dominate attention for some time to come, the response to qualitative issues such as these will in large part determine the respect and value accorded to distance education programmes and to those, both staff and students, who participate in them'.

It is important that these qualitative issues are understood, sooner rather than later, and translated into more effective practice otherwise we run the risk that present practices will become legitimated and beyond critique. I would like to take up one of these qualitative issues in this paper and to develop what Habermans (1972) terms 'exploratory understandings' of text in distance education at the same time encouraging distance educators in Papua New Guinea to critique their personal conceptions of text and to explore alternative conceptions.

The Centrality of Text in Distance Education

The structure and organisation of distance education programmes are such that for the majority of participants, whether they are course developers or students, the text is perceived as central to distance study (Thorpe 1979). Yet despite this, text in distance education is something that we know little about. Reviewers readily debate the selection of the *content* of texts but few writers have been concerned to delineate the *form* of text in distance education.

Text in distance education not only refers to the printed word but to the knowledge forms which are available from the new educational technologies which are becoming increasingly important in distance education. Text is found in the prepackaged courses common in distance education, or displayed on interactive computer terminals, or contained in audio-tapes, or that produced through face-to-face interactions. Text in distance education can be considered as the preferred discourse of a course team or writer and as such represents an ideological statement in relation to responsibilities for and decisions about objectives, pedagogy, content and assessment procedures in learning in distance education. Text, more often than not, is treated by readers 'as an object to be consumed' (Baudrillard 1981), but text, as Alvarado and Ferguson (1983) point out, is more complex than this and needs to be deconstructed and denaturalised and conceived in transformative terms (Barthes 1974). The learner is empowered, as a result, to define and critique conceptions of knowledge and ultimately to become a producer of text.

All texts have an ideological intent such as that contained in the following consensual view of society, 'The mass media are very important because they help everybody to know *what is happening anywhere in the world*. Mass communication helps the government to *tell everybody* what is happening in Papua New Guinea and it also helps the people to *know* what the government is doing' (College of Distance Education - Grade 9 Social Science, Unit 3, p. 94 italics added). A critical theorist (Apple 1979) or radical writer may present a different viewpoint about the media and government but would be making no less an ideological statement. However, there is also an ideological intent by omission as Henderson (1980:215) puts it, 'the problematic of a text is not only the questions that it asks, but the questions that it does not ask. Specifically, it is the relationship between these, for a text relationship between questions asked and questions suppressed is always ideological'. The University of Papua New Guinea's Advanced Diploma in Teaching, curriculum course gives the appearance of 'completeness' but omits neo-Marxist views of curriculum or curriculum negotiation.

Critique enables us to understand the ideology contained in the *content* of text, but more subtle, and therefore open to manipulation, is the ideology that is found in the *form* of text. I would like to suggest a framework at this point which conceives the *form* of text in distance education in terms of technocratic, interpretive and radical constructions. This framework will enable some of the theoretical conceptions of distance education to be related to the discussion.

Technocratic Texts

A technocratic text focuses on the elements of control, prediction and certainty in which knowledge is mediated through the control of the objectified world. Technocratic texts are synonymous with a conception of distance education in terms of industrialisation (Peters 1971; 1989) in which text is conceived as relatively neutral phenomena, produced by instructional designers (Nunan 1988) and governed by the technical imperatives of what Evans and Nation (1989b) describe as 'industrial instructionalism'. So influential has the industrial view of distance education become throughout the world that the analysis by Rumble and Harry (1982) of the emergence of distance teaching universities, is a description of institutions which are mostly embedded in a technocratic rationality of education. Villarroel (1988) exemplifies the continuing strength of this rationality when he argues for the need to plan distance education universities so that, 'The teaching is of a formal nature in that it uses technical means to transmit information, and two-way communication is stimulated to allow the student to consult his tutor; in addition, intensive use is made of industrial approaches for certain academic tasks and for the production of teaching aids' (p.56). Industrial instructionalism tends to consist of prepackaged books of readings, study guides and assignment books, are mostly self-contained, and are inspired by Gagne's (1985) learning principles which arouse attention and motivation, present elaborate learning objectives, make links with previous knowledge, prescribe the content to be learned, guide and structure, activate and provide feedback, and lead students straight to specific goals on the condition that they are capable of following the exposition and of doing the exercises and solving the problems set. The distance materials from the College of Distance Education which offers secondary courses from Grades 7 to 10 throughout Papua New Guinea exemplify the technocratic approach. The knowledge that is made available to the learner, in the Grade 9 English course, for example, through common core materials supported by a package of individualised materials and assessed through an assignment book, is for consumption and reproduction. These texts are prescriptive and deny students the experience of a range of writing styles, apparent or real contradictions of data, or genuine theoretical and ideological conflicts (Kaye 1981). The learner is led, step-by-step, through the materials which often provide laws to explain the world (College of Distance Education - Grade 10 Commerce course). The use of summaries, reviews and the provision of answers to self-assessable questions by the writer, produce a seemingly uncontestable view of knowledge which confirms the 'expertness' of the writer and the materials and the novice status of the learner. What form of learning is represented in these materials, what view of knowledge do they imply and whose interests are best served by them?

Comprehensive distance teaching packages only serve to reinforce the dependent relationship between students and the supporting institutions and tend to reflect the social relations existing within society (Jarvis 1985). Apple (1979) has warned of the dangers in 'deskilling' teachers through systematic teaching packages and parallels can be drawn with distance education in which instructional designers assume control of the production of materials and the definition and ownership of knowledge forms on behalf of distance students and denying students the opportunity of participating in such activities. The discourse is regulated by the materials and the institution and the course writer has control over the definition and selection of knowledge, even to the extent of supplying model answers (Kaye 1981).

Writers in Papua New Guinea need to challenge their present assumptions about knowledge and the role they play in the selection of content for their materials. Where is content drawn from and whose domains does it represent? Is it based on universal conceptions of knowledge, the social and cultural capital of the writer or that capital which is indigenous and derived from conceptions of knowledge based in Papua New Guinea? An argument is often put forward that distance courses in Mathematics and Science, for example, can only contain universal conceptions of knowledge but writers such as Clements (1989) and Hewson (1988) present evidence which suggests that this is not always the case. Williams (1976:205) refers to the selective tradition:

> that which, within the terms of an effective dominant culture, is always passed off as 'the tradition', the significant past. But always the selectivity is the point; the way in which from a whole possible area of past and present, certain meanings and practices are neglected and excluded. Even more crucially, some of these meanings are reinterpreted, diluted, or put into forms which support or at least do not contradict other elements within the effective dominant culture.

Harris (1987) provides interesting qualitative evidence as to the ideological divisions which this selection can create, from time-to-time, within course writing teams at the Open Unversity. There is an additional burden in all this for Third World countries in that often course creation and selection is the responsibility of expatriate writers who may, intentionally or unintentionally, lack an adequate understanding of the social and cultural capital which is available for selection (Guy 1987). The culture and the ideology of the writer remains invisible to the distance student, whereas the distance educator has a dossier on the student in terms of enrolment information and accumulates further data as each assignment is assessed. This serves to maintain and strengthen the unequal power relations between teacher and student. Moore (1977) has suggested that distance education is an independent and autonomous activity in which the student has an influence at least equal to the distance educator in determining learning tools, resources and evaluation decisions. But the situation is far from this in reality. Distance educators have failed to respond to Moore's theoretical constructs in practical ways. The temporal and spatial context of distance education and the need to fulfill assignment schedules, a prescribed academic year, credentialism and graduation dates further prevent the student from having any power over the learning situation. The only form of contestation in these circumstances is withdrawal from a course of study.

Technocratic texts tend to reproduce the social and economic relationships found in society. The unquestioning acceptance of knowledge as presented in these texts reflects the power relationships evident between powerful and less powerful groups in society. The form of a technocratic text serves to legitimate social, economic and political relationships within society (Taxel 1980) and is summed up by Anyon (1979:40) when she concludes a study of the forms of knowledge in textbooks as, 'that which provides formal justification for, and legitimation of, prevailing institutional arrangements, and forms of conduct and beliefs'.

Distance education and technology are evolving more complex interrelationships, and Rumble (1989) describes recent initiatives by universities which are employing satellite, computer-based video and interactive video technology for seminars and teaching between and within countries, and initiatives by multinational publishing companies in international computer conferencing and satellite broadcasting of educational programmes. These technocratic developments raise the possibility of further growth in the internationalisation of distance education, at a level far removed from the present borrowing or buying of courses from one part of the world for use in another part. The form of technocratic texts, and the ideology implied in the internationalisation of text, not only promotes overt control of the curriculum but there is covert control as well as suggested by Anyon (1979:362) who notes the influence of multinational publishing companies on texts which 'often undergo substantial editing by publishing company personnel concerned with meeting requirements of school markets'. The trend towards multinational distance teaching institutions such as the Commonwealth of Learning based in Canada and the University of the World located in California may ultimately represent a new wave of industrialisation and internationalisation of distance education (Lundin 1988). Monsell-Davis and Naidu (1989) suggest that the growth of international distance institutions will lead to greater sharing of courses and cross-accreditation of courses but Nunan (1988) is more concerned about the possibility of renewed forms of cultural imperialism as an outcome of the internationalisation of education.

The ideology of technocratic texts is technological, reproductive and legitimating. Critical text analysts such as Barthes (1974) term technocratic texts as 'readerly' texts, Eco (1979) calls them 'closed' texts and Wexler (1982) calls them texts for 'consumption'. The portrayal of course development, and subsequent learning based on those materials, as a routinised, technocratic process is a severely limited account of the human interactions which make up such activities. The notion that humans are more than merely passive, and are active, and contest and resist the reproductive mechanisms of the dominant group are lost in a technocractic view of text. Interpretive text, on the other hand, claims to recognise human agency and structure in learning but the reality of these texts to accommodate agency requires some reflection and critique.

Interpretive Texts

An interpretive text focuses on the forms, categories, and assumptions beneath the texture of everyday life which contribute to our understanding of each other and the world around us. Human beings through language and thought constantly produce meanings and interpret the world around them. Knowledge in interpretive texts is not viewed as objective and value-free, as in the technocratic text, but as a social construction subject to the perceptions and experiences of those who negotiate its meaning. Holmberg's (1983) notion of distance education as 'guided didactic conversation' attempts to simulate the social nature of learning by incorporating a range of literary devices which seek to involve the student emotionally with the author and the content of the text. Techniques derived from metadiscourse (Crismore 1984; Kantor 1983) provide further impetus for the development of interaction between distance teaching materials and students (Gillard 1981). Metadiscourse is the 'contentless' level of texts and represents the author's intrusion into the discourse through directives given to readers so that they will understand what is said and meant in the primary discourse. For example, 'The question then is **why** did European governments come to Papua New Guinea? The argument below is part of a more general argument, about why Europeans took colonies at all' (UPNG - Extension Studies Department, National History, Course Guide 2, p.107) and includes techniques such as 'It is important that you grasp the meaning of these concepts or you will not understand what is being said in the chapter' (UPNG - Extension Studies Department, Economics 1, Study Guide 1, p.4) and 'The learning activities are grouped according to their degree of difficulty - easy, moderate, difficult' (UPNG - Advanced Diploma Unit, Physics, Unit 8, p.iii). Writers may use first person speech and comment upon arguments and evidence, concepts are sorted and summarised, further readings are suggested and questions for discussion are put forward to encourage interaction with, and interpretation of the material.

Interpretive texts tend to follow what Maccabe (1981) describes as 'realist' strategies in which a number of different accounts or practices are used for analysis but ordered in the narrative in such a way as to represent a form of reality which is given the appearance of 'matter of factness' and leads the reader to a 'true' interpretation of events. Many history and sociology texts are so ordered in the belief that the material can be 'interpellated' by the reader but the implications for ideology are profound as the realist discourse in fact leads the reader to a preordained position in terms of the material. Harris (1987) reports that Open University students do not change their commonsense views regardless of how much they are encouraged to do so through interpretive text and they are unable to draw implications for areas other than those discussed in the text. The interpretive approach ultimately treats the reader as a passive consumer of text who often relies on commonsense meanings or the views of others to make sense of events. The notion of interpretive text requires some consideration of the orientation of students to learning. We cannot assume that all students will react to metadiscourse techniques in expected ways and want to challenge existing theories or to take the time to reflect and critically assess a range of viewpoints. Distance students may prefer to adopt an instrumental approach to learning and the form and the techniques of an interpretive text only serve to provide students with shortcuts and use study guides as primary reference material. Students are happily 'pushed' into accepting the author's view of reality.

The very essence of a course of study may suggest that an interpretive text is a compatible approach for a distance education programme. The UPNG - Department of Extension Studies, National History course states: 'Although you will receive some guidance in the Introduction to the Readings which follows each lecture, you must form your own opinions on the value of each Reading' and later 'You should read them for the historical information they contain, but also .... to critically examine the sources available to you in studying history' (Course Guide 1, p.13). This particular course in National History begins with an important Reading which stresses the value of oral history in an orally based society such as Papua New Guinea. This view of evidence and history suggests the possibility of a high level of involvement in the collection of evidence and its subsequent interpretation by distance students but this approach is demeaned by the student activities in this course which are of the multiple choice and short answer kind and which require comprehension skills rather than interpretive or critical skills. It is interesting to note that a separate course in Oral History is offered as an on-campus course in Port Moresby, where much pre-contact oral history has been lost, but in isolated areas around the country oral history continues to be a rich source of evidence of the traditions and change within this country. This may represent an opportunity lost for distance education in which students could be actively engaged in the location and definition of knowledge. Despite the claims made for interpretive text, many of these materials in distance education remain prescriptive and monologic in conception and production.

The definition of knowledge and text production in interpretive text continues to remain with the author and the supporting institution. This becomes an issue of power and the role of the student in the definition of knowledge and the creation of text. In order to empower students distance educators need to genuinely recognise the importance of human agency in education and the social structures which surround education in time and space (Giddens 1984). The notions of human agency and structure are important issues for distance educators because learners actively engage with text, but not always in the manner expected by course developers. A clearer recognition of human agency and structure leads us to a conception of radical text.

Radical Texts

Social action programmes presently emerging from Third World countries in South America and Africa emphasise participatory procedures (Edwards 1989; McTaggart 1987; Tandon 1988) which view people as subjects rather than objects, and as having control of their own destinies rather than the victims of the desires and social processes of others. These procedures have much of their origins in Freire's (1974) notion of 'conscientisation' and the critical theorists views on empowerment and emancipation. A radical view of text assumes a role for the distance educator which is vastly different to the technocratic conception of the distance educator as an instructional designer, or the interpretive conception of the distance educator as a well-meaning facilitator. Rather, it is a social role based on the assumption that the creation of text is a social process directed towards social values and ends. It assumes that distance learners will construct their own meanings in active ways rather than adopt the role of passive readers of text.

Radical texts have been termed as 'writerly' texts (Barthes 1974), 'open texts' (Eco 1979), or texts for 'transformation' (Wexler 1987) which enable students to participate in the construction and transformation of knowledge and text. A 'writerly' text is one that is produced by the learner rather than an anonymous curriculum developer or institution. It is an outcome of practice in which the practical knowledge embodied in daily affairs is made evident so that human and social action become both relevant and morally wise. A premise of the 'writerly' text is the problematic nature of knowledge and the ensuing social relationships which develop from this conception. This is not an easy form of text to conceptualise or to realise because of the strength of the prevailing technocratic and interpretive notions of text in distance education. Farnes (1975) has suggested that the only way distance students can become competent is to carry out similar tasks to those carried out by course team authors. In reality, few institutions have attempted such innovations. An emerging development in distance education is for dialogical distance materials (Evans and Nation 1989a; Gaskell and Mills 1989) which recognise students as the key agents in their own learning. In this form, 'dialogue should be encouraged through the course materials by providing students with knowledge, skills, ideas and values which are relevant to their needs and interests, and which they can use actively to understand, manage and change their social worlds through dialogue with their fellows' (Evans and Nation 1989a:38). Modura (1989:128) reports on the successful use of journals in an undergraduate librarianship course, 'The journal was to be a structured assemblage of comment and criticism on subject-related readings, events, media items, thoughts, conversations and the like, which would require the student to investigate political, social and cultural events and trends - local, national and international - and think and write about how these did, or could, affect libraries and librarianship'. Fitzclarence and Kemmis (1989) reflect on the use of a course journal in a distance education programme at Masters level, which is published regularly throughout the period of the course, and in which a critical community of enquirers at a distance is established. The course journal enables the collaborative exchange of knowledge on an equal basis between the course team members and participants in the programme. Knowledge is no longer 'private' between tutor and student but becomes 'public' and available for critique.

A course such as Research Methods in Social Science (UPNG - Advanced Diploma Unit) enables participatory research to be undertaken in a distance education programme. The text is 'open' waiting for teachers to define it through action research which empowers them to gain practical experience and understanding that knowledge is a result of human agency rather than accepting the reified practices of the past. Instead of treating an issue such as school-based inservice activities in Papua New Guinea from a theoretical point of view for instance, an action research project by a teacher resulted in the realisation that her unsuccessful attempts to encourage inservice activities 'goes back to the way that the school is run. The Headmaster who has been at this school for a long time does not support changes to the way he likes to do things and run the school' (Toksave 1988: 10). Action research aims to be emancipatory and the teacher involved later commented that she had lost respect for the expatriates at her school because their lack of co-operation in inservice activities was actively working against 'localisation' policies and aimed at protecting their own positions. The Matane Report (1986) has advocated a conception of education which is participative and liberating and the ideas of radical text assume greater prominence for distance education in Papua New Guinea in this context. I believe that distance educators in Papua New Guinea need to adopt a critical and reflective perspective about present practices in the expectation that sensitive and appropriate distance education practices will emerge which best suit the educational and social contexts within Papua New Guinea.

The role of assessment and 'getting through' courses has the potential to override the radical approach for distance educators and students and may represent a justification for the technocratic and realist approaches to text, but radical text is worthy of consideration by distance education for what it implies in terms of freeing students through participatory and collaborative processes. Ultimately students can demonstrate their understanding of the course materials in active and transformative ways rather than by passively reproducing knowledge. Radical text may be easier to conceptualise in higher education distance programmes but it is no less relevant to other forms of education. The role of the distance educator and distance materials remains crucial but more so in the relationships which are established to empower students to take more active and responsible roles in learning.

Conclusion

I began this paper by stating that fashionable educational ideas have been too readily imported into Papua New Guinea without sufficient critique. I do not want to be accused of endorsing yet more fashionable ideas, nor should it be overlooked that readers bring with them a range of intra and extra-textual discourses such as prejudices, levels of language facility and contestability (Willeman 1978) that prevent even the most 'closed' of texts from determining its own meanings. It can also be argued that the framework I have suggested is rigid and in fact distance materials can contain a range of forms within a programme. The purpose of the paper is to stimulate discussion. Distance education in Papua New Guinea is tied predominantly to a technocratic approach which is not unexpected, given the strength of the industrial approach to distance education. There is evidence that distance education may be emerging from the constraining ideology of industrial approaches as more liberating philosophies and conceptions of distance education are being debated and put into practice.

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JUST PUBLISHED

THE ECONOMICS OF PUBLIC INVESTMENT IN EDUCATION IN PAPUA NEW GUINEA

by

Timothy Curtin

University of Papua New Guinea Press (164 pp.)

The conventional theory of human capital formation recommends redirecting public resources in developing countries from secondary and tertiary education to primary. Curtin's monograph re-establishes the economic case for expanding public investment in post-primary education on the basis of the more than proportionate contribution to total taxation paid by the more-educated members of the labour force. Curtin's data also refutes the conventional view that enhanced access to education reduces rather than increases the probability of gaining employment, and he produces a compelling demonstration that primary education alone is not enough to ensure productivity growth in agriculture or industry.

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DEVELOPMENTS AND DIRECTIONS IN SOCIAL SCIENCE DISTANCE EDUCATION AT THE UNIVERSITY OF PAPUA NEW GUINEA

Anne Crossley

Developments in social science distance education in the Department of Extension Studies at the University of Papua New Guinea have been especially significant during the latter half of the 1980s. Not only did the number of students enrolled in social science subjects increase greatly (see Table 1) but also the number of social science courses on offer each semester grew noticeably (see Table 2).

Table 1: Numbers enrolled in social science subjects, 1986 - 1989

Year	Semester 1	Semester 2	Lahara	Total
1986	208	268	78	554
1987	146	86	108	340
1988	201	147	105	453
1989	353	222	163	738

Table 2: Number of social science subjects offered, 1986-1989

Year	Semester 1	Semester 2	Lahara	Total
	2F	2F	4F	
1986	3 1M	4 2M	2 M	9 5M
	2F	1F	1F	4F
1987	3 1M	2 1M	3 2M	8 4M
	2F	2F	1F	5F
1988	3 1M	3 1M	3 2M	9 4M
	2F	3F	2M	7F
1989	4 2M	4 1M	4 2F	125M

Note: F = (Foundation/Degree); M = (Matriculation)

To some extent this increase reflects parallel developments across the whole of the Department of Extension Studies (Department of Extension Studies 1988), but in the case of social science it can be foreseen that in the future the number of courses is likely to keep growing. In most other subject is areas there is a more limited number of courses possible. Social science covers a multitude of Arts Faculty subjects ranging from psychology to economics, and politics to sociology. For example, all Arts Foundation degree subjects at present externalised, except for one, are social science offerings

Over the past four years, developments have occurred in the social science area at both matriculation and degree levels. In the matriculation social science programme there are now five courses on offer. History of Science and Technology, the only compulsory social science course, has been completely rewritten and reorganised, as has Issues in Development in Papua New Guinea, a topical current affairs course. Cography remains to be revised. Asia and the Modern World is a brand new course relating to Asian History and covering developments in four major Asian countries. It was run successfully for the first time in 1989. Another new course is Introduction to Economics, trialled in Semester 1,1990.

Student Support and the Pattern of Learning Materials

All the social science matriculation courses are written specifically for external students, and do not rely upon field tutors, although suggestions for tutorial discussion are given after each study unit. The courses include clear guidance on study schedules, assessment and study skills (such as essay writing, map interpretation or note taking) required by the particular course. An interactive style is used, where the narrative is interspersed with short activities, maps and questions and the use of illustrative material is considered very important.

Words with special meaning are printed in bold in the student text, and a glossary is provided for them. Self-assessment questions and model answers are also given for every unit of work, with each lasting about one week. We have tried to develop a common pattern for all of the social science courses. This model comprises an introductory booklet, providing the student with an overall view of the course; three or four study guides, divided into weekly units; and a revision booklet. A book of short, relevant readings is also provided. These readings are considered during study or referred to in the study units; and they provide extra detail and wider background knowledge on the subject. Reading guide questions with model answers for each course provide further help with comprehension. Assessment is normally based on four to six assignments which may include essays, short-answer questions, map work, documentary studies, tests - and a final closed book examination. The revision booklet provides a general summing-up of the main ideas of the course, revision skills and a sample examination paper with model answers.

In designing this interactive model for all social science materials it was recognised that for many matriculation students it has been a long time since they last undertook any academic work. For this reason, summaries, overviews of the main points raised and discussion questions are all important features of the courses. In addition, in the future, it may well be possible to 'tier' the social science matriculation courses branching out from the issues course as a core. Issues in Development is seen as the 'basic' social science course which introduces students to many different academic skills and subjects (history, geography, politics and sociology to name a few). This course is also probably the most culturally and topically relevant course for Papua New Guineans, as it focuses upon events now taking place in the country. From this beginning, students can go on to study specialist history, geography or economics options concluding with the History of Science and Technology, which is both a compulsory and, perhaps, the most advanced component of matriculation social science.

At degree level the external Arts Foundation Year is still not complete, with two social science courses (among other subjects) to be externalised - Introduction to Politics and Introduction to Geography. However, comprehensive guides as to how these courses could be externalised have been prepared for the departments concerned, although lack of time and resources have, to date, prevented any substantial development. Revised courses in Economics I and Introduction to Psychology are now being run, and Study of Society - the foundation course in sociology and anthropology - is being completely rewritten. Also being rewritten is National History.

The Organisation of Distance Education Responsibilities

The social science coordinator within the Department of Extension Studies is responsible for all course development in social science at matriculation level. At degree level, the relevant teaching departments of the courses undertake the work although Extension Studies staff provide advice on the externalisation process, editorial assistance and support with the physical production of course materials. In some cases considerable help has been given with the writing of courses as well. The main obstacle to course development at both matriculation and degree levels is the lack of time and resources available for this important activity. The current Five Year Plan for the Department of Extension Studies (1988) emphasises the immediate need for additional staff in both the academic and administrative areas, and has specifically pointed out the dilemmas facing any social science coordinator in trying to cover all the academic disciplines which presently come under the Arts Faculty (Department of Extension Studies 1988).

Administering Social Science at a Distance

In view of the recent increase in student numbers and courses, the administrative and teaching workload of the social science coordinator has dramatically increased to the point where further growth will become seriously constrained without additional support. There are, on average, 300 students a semester to look after, and they are widely dispersed nationwide. For instance, in Semester 1,1990 there were 50 outstation students. The overlap of the three semesters each year also ensures that there is no break in the ongoing administration from the end of one semester to the beginning of the next. This is a significant issue in its own right.

Dilemmas of an Academic Role Combined with Distance Education

It is into this context that the main academic and professional activities of the social science coordinator must fit. These include the writing, revising and preparing of course materials, advising on externalisation, and the editing of social science courses being prepared by other people. Indeed, in recent years the name course developer for social science was used for the post, but this is patently incorrect. Course development is only one facet, admittedly the most important, of the role, and increasingly this has to be fitted in to a demanding administrative schedule. It must be emphasised that all positions of course coordinators in the Department of Extension Studies are academic ones. They are of lecturer status, and as such, post-holders should also be fully involved in research, consultancy and broader administrative activities of the University.

Balancing Priorities

In recent years, valuable assistance has been provided by temporary staff hired specifically to work on the development of new social science courses. However, the social science coordinator is, first and foremost, employed as the experienced distance educator and writer, and to lose this specialised expertise to the demands of repetitive administration is wasteful. Looking to the future, the priority for assistance in social science must be in the administration of the courses, in the marking, assignment and examination setting and in the support of students.

Table 3: Analysis of social science matriculation courses and examination results, 1986 - 1989.

Course	Year	Sem.	No. Registered	No. Completed	Passes	Attrition Rate (%) UF/W	Pass (%)
Issues in Development in PNG	1986	1	82	54	52	34	63
	1988	1	87	68	65	22	74
	1989	1	156	107	105	31.4	67
Geography	1986	2	38	24	23	37	60
	1987	1	31	16	15	48.4	48
	1987	2	21	19	16	9.6	76
	1988	2	53	42	40	20.8	75
Empires	1986	2	49	25	24	49	48
History of Science and Technology	1989	1	64	49	47	25.7	71

Without this type of efficient support, external students will suffer, as will the credibility of the courses on offer. Matriculation courses, perhaps, demand the greatest attention in each aspect because they are the total responsibility of Extension Studies staff. However, if external degree level courses are to prove effective they too require considerable liaison with other departments and staff, combined with efficient monitoring and support. Consistent administrative and tutorial support of a personalised nature is especially necessary in Papua New Guinea if we are to minimise attrition rates; without it individual students easily get discouraged.

Workload implications, however, must be given serious attention if the academic dimension of the social science coordinator is not to suffer further.

Much research now needs to be done into all aspects of the work of the Extension Studies Department at the University of Papua New Guinea. Attrition rates of students vary widely from course to course, with, for example, social science foundation courses suffering much greater attrition than those in the matriculation programme (see table 4).

Table 4: Analysis of foundation courses and examination results, 1986-1989

Course	Year	Sem.	Students Registered	Number Completed	Passes	Attrition Rate (%) UF/W	Pass (%)
Introduction to Psychology	1986	1	48	26	25	46	52
	1987	1	10	5	5	50	50
	1989	1	108	53	50	51	46
National History	1986	2	78	33	27	58	35
	1987	1	105	43	35	59	33
	1988	2	43	17	15	60.5	35
	1989	1	23	9	9	61	39
Economics 1	1986	2	80	34	24	57.5	30
	1987	2	65	25	20	61.5	31
	1988	2	43	15	12	65.2	28
	1989	2	42	10	5	76	12
Study of Society	1986	2	101	37	29	63.4	29
	1988	2	51	25	18	51	36
	1989	2	25	9	8	62.5	33
Critique of Capitalism Colonialism	1988	1	71	39	31	45.1	44

Why this is so requires investigation, and the conduct of such research would be of real benefit to course writers, coordinators, tutors and administrators in the departments involved. Many other aspects of research also offer themselves in this growing field of education in Papua New Guinea. Continuing research should be part of the role of the social science coordinator, but a general university research officer could perhaps be appointed to lead such an evaluation, supported by University Research and Publications Committee funds. It would be a timely initiative.

Tables 3 and 4 include only those courses with an enrolment of 10 or more students. Other courses (for example, Melanesian Societies) have been run with negligible numbers. The numbers registered for a course include withdrawals, and pass rates are taken from overall enrolment figures. The number completed does not include UFs (students who have not finished the course).

Lahara figures are not included as they are atypical - the type of teaching involved ensuring high pass rates.

Conclusion

Future developments in the social science area in the Department of Extension Studies will have to rely heavily upon the success of improved administrative procedures combined with the ability of the University to generate extra help for general administration and course production. Priority must now be given not only to quantitative expansion (in student numbers and courses), but also to qualitative improvements in all aspects of course development, production and implementation. The growing demand for extension studies courses proves that there is an urgent need for this type of off-campus education throughout the country - and successive governments have expressed enthusiasm for distance education at this level.

Distance education has great potential to improve access to higher education and this mode of study is especially appropriate for disadvantaged student groups such as women (Wormald and Crossley 1988), the unemployed, school leavers and those working part-time - anyone in fact for whom access to normal channels of further education are now restricted for financial or other reasons (Davis and Naidu 1989). At the other end of the spectrum, access is widened for professionals and workers such as school teachers, policemen and policewomen, defence force personnel, public servants and those from the private sector. The employers of such groups presently see great advantage in financing their staff through external programmes as a way of investing in inservice and further professional development and training. For such investment to be worthwhile, however, qualitative aspects of external provision must also ensure a realistic success rate for external studies. Enrolment figures alone do not justify expenditure and effort. In times of severe budgetary restraint (as is characteristic of the last five years at the University of Papua New Guinea), expansion of enrolments must be tailored to the ability of the distance education system to successfully support such numbers. Within the social science disciplines there are some indications that this limit is close to being reached - additional resources, both human and material, will be required to support further expansion of significance. Moreover, increased attention to the monitoring of success rates, to the causes of attrition and to ways of improving support services will become increasingly important. Such research and evaluation can only be undertaken within Extension Studies if the pace of development and expansion itself allows, or if the necessary extra resources are made available. Alternatively, Extension Studies could be well supported by the University itself if Research and Publication Committee efforts to establish a centrally funded and staffed student monitoring project incorporate a distance education component sensitive to the unique problems faced by external students.

If such evaluation initiatives are supported the data generated could prove most useful in shaping future University policy for Extension Studies; it could also assist to strengthen the research data base for this field of study, and help to guide improvements to the qualitative aspects of external study for all students enrolled - not least the increasing numbers pursuing courses in the social sciences.

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DISTANCE EDUCATION AND THE EDUCATION OF LIBRARIANS IN PAPUA NEW GUINEA: A NOTE ON PLANNED DEVELOPMENTS

John Evans

In 1968 a Library Assistants' Certificate course was introduced at the Administrative College and education for librarianship established a firm presence in Papua New Guinea. Courses have evolved from that early start and are now provided at Certificate, Diploma and Bachelors Degree levels, with a major change as courses moved from the Administrative College to the University of Papua New Guinea during 1988. All courses in this subject have run on-campus, but recent years have seen an interest developing in the use of distance education methods for the education of librarians in Papua New Guinea. While nothing is actually available as yet the issue has been thoroughly discussed and the climate of opinion within the profession has moved from being one of quite considerable opposition to the idea to one in which new innovations are likely to be accepted.

Papua New Guinea is fortunate in that the successful example of the University of the South Pacific Certificate in Librarianship has been available. In addition, Australia has been the scene of experiments in the use of distance learning packages in teaching this subject (Trask and Browne 1978) and has provided texts outlining developments in various countries (Reid-Smith 1980). We might be seen, therefore, to be comfortably in advance of other countries where, although interest is developing, surveys show a situation where talk is more common than action and a lack of knowledge of developments is widespread:

Ignorance about what is being done in this field reigns supreme, not only between countries but also within them (Haythornethwaite and White 1989).

However existing surveys (Haythornthwaite and White 1988) deal only with professional level courses and ignore sub-professional courses such as the University of the South Pacific Certificate in Librarianship or the kind of programmes we would hope to introduce in Papua New Guinea. Having declared an interest the task for the Department of Library and Information Studies will be one of converting talk about the potential of distance education into action. At the time of writing the possibilities are in the field of courses for teacher-librarians for Papua New Guinean schools and of extension versions of parts of the Diploma in Library and Information Studies which should benefit those working in conditions of considerable professional isolation in the provincial libraries of Papua New Guinea.

The Slow Acceptance of Distance Education

There has been very little mention of the potential of distance education in the Papua New Guinea library literature though the use of correspondence methods as a possibility for the training of school-librarians has been raised (Calvert 1983). This idea was just one contribution amongst many in what has turned out to be a controversial issue with various propagandists and numerous competing ideas as to the sort of course that needed to be introduced (Evans 1988).

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While Calvert may have been the first to mention possible uses of distance education the formation of a working party on library education of the Library Council of Papua New Guinea in 1985 provided an opportunity to discuss the possibilities for distance education. In particular, Howard Van Trease, Director of Extension Studies at the University of Papua New Guinea attended meetings of the working party and was able to outline what distance education meant and what was already happening in Papua New Guinea via the University Extension Centres. He was also able to outline the successful experience of the University of the South Pacific with their Certificate in Librarianship course. Copies of the materials for this course were also made available to members of this working party. There was opposition within the working party in part from American librarians, to whom this idea is almost an anathema in education for librarianship (though this too seems about to undergo change) and from those who found it hard to believe that librarianship instruction could be undertaken without access to a significant library facility in which to practice. Within Administrative College Library Studies there was also opposition to the idea - one member of the staff had experience of the University of the South Pacific programme and of the considerable work of preparation and marking that this entailed. Given this dissension all that was possible was for the working party to discuss the introduction of distance education courses as a far off possibility.

The cause of distance education was given another important fillip through the appointment of a consultant to investigate the librarianship programmes at the Administrative College. Prof. Pauline Atherton-Cochrane was appointed to do this and the funding agency, the International Research Development Centre of Canada, added an examination of the University of the South Pacific librarianship programme to the consultant's terms of reference. A visit to Suva was felt to be necessary but this was not undertaken owing to other commitments. This consultant proved to be supportive of the idea of distance education for librarianship in Papua New Guinea and was able to advance the cause both at Library Council and at the Joint Board of Library Studies. This support further assisted in muting opposition to the idea of distance education as a possible means of delivery of librarianship courses.

As a result of the consultant's report and recommendations (Cochrane 1987) librarianship courses moved from the Administrative College to the University of Papua New Guinea. One of the tasks was to develop a Department of Library and Information Studies at the Faculty of Education. This involved the production of a departmental four year plan (UPNG, Department of Library and Information Studies 1988). In this plan it was possible to outline various cases in which distance education might be used. Being part of the University of Papua New Guinea, of course meant that the facilities of Extension Studies could now be utilised - an impossibility at the Administrative College.

Further approval for the idea of distance education has come from the Advisory Board of the Department of Library and Information Studies which began meeting in 1989. Fortunately, it has been possible to get librarians from the provinces to attend this and they in particular have been supportive of training opportunities being made more generally available in the provincial arena.

Distance Education and the Departmental Four Year Plan

Currently, the department provides courses at Certificate, Diploma and Bachelors Degree levels. The Certificate emphasises basic routines and is an entry level course to library work. There is no plan at present to externalise any of this course though as part of it students are required to undertake adult matriculation studies in English and mathematics. The Diploma in Library and Information Studies consists of eight Arts Foundation Year courses plus eight Library and Information Studies units. Owing to the existence of extension versions of many of the Arts Foundation Year courses it is already possible to cover this aspect of the course via the UPNG Extension Studies. In the plan it is hoped to provide for extension versions of Library and Information Studies courses and thus provide the complete Diploma by distance education. This would be to the benefit of the many isolated libraries and their staff in the provinces of Papua New Guinea and would certainly please the provincial membership of the Advisory Board.

While the University of the South Pacific has provided a Certificate in Librarianship by extension for several years, a further development is now going ahead as that institution has already obtained funding to produce distance education materials for their Diploma in Library/Information Studies. This is a new introduction (Simmons 1988) and has considerable similarities in its librarianship aspects to the University of Papua New Guinea, Diploma in Library and Information Studies. The first two units have been written and four units should be available by the end of 1990. An obvious course of action would be to adapt the materials produced by the University of the South Pacific to the needs of the University of Papua New Guinea. While there is excellent potential for cooperation in this respect and this move has been encouraged by the International Development Research Centre of Canada, detailed negotiations are needed to convert this into reality and this seems a thorny issue at present. Permission to use the material would need to be obtained from the University of the South Pacific and this should be the next sensible step. If this is not readily obtained then matters in Papua New Guinea will be delayed until we can write our own materials and this will result in a further cycle of talk rather than action on distance education and librarianship. It will certainly be counter-productive in view of the cost and time involved to develop our own materials for the very similar courses. It might, however, be worth providing packages for units that will not be provided by the University of the South Pacific. As the USP course is a very traditional one, the scope for additional courses is very wide indeed. An example would be an "Introduction to archives and records management" where the University of Papua New Guinea has a course that is being taught on-campus during 1990.

Distance Education and the Teacher - Librarian

Here, two innovations are being pursued which are likely to have a significant impact on school libraries throughout Papua New Guinea. The University of Papua New Guinea has recently introduced a Diploma in Teaching (Primary) which is being taught entirely by distance education methods and is aimed at upgrading the qualifications of community school teachers nationwide. Teachers choose from a variety of courses provided by the Department of Extension Studies. It has been decided to provide a unit on the Community School Library to complement the material provided for this qualification. This would target the needs of teachers who would be responsible for the development and operation of libraries within community schools. Given that the school may have the only collection anywhere in the community, the concept of attempting to develop community service, where and if appropriate, will also be introduced. The syllabus for this module is being developed and the course should be available by the end of 1990.

As can be seen, it was in the context of education of school-librarians that distance education first came to be mentioned in Papua New Guinea. At long last a programme allowing for the training of the teachers in charge of high school libraries is to be introduced within Papua New Guinea.

This will involve a somewhat different pattern of operation as it will be based on the existing successful distance education model of the Diploma in Educational Studies that found considerable application at the Faculty of Education at the University of Papua New Guinea. This will come into operation as a Diploma in Educational Studies (Teacher-Librarianship) from Lahara 1990. The features and advantages of the DES model are already recorded (Smith et al. 1984) and need not be repeated here. What must be pointed out is that use of this model has allowed for a breakthrough to be made in place of the competing and conflicting notions that were previously available. The supervision visits that will attach to the course will allow for a significant number of high schools to receive professional visits which can only be beneficial. The visits might be coordinated with workshops for other schools in the area thus ensuring a trickle down affect for the enhancement of a number of libraries from each particular visit.

Conclusion

There is every hope that distance education can be used to provide courses that were hitherto considered as only remote possibilities in the country. The introduction of thorough packages to assist in the operation of school libraries will be of real benefit and will compensate for years of neglect of this sector of training. If, in addition, progress is made on an externalised version of the diploma, with the modification of the University of the South Pacific materials, significant improvements in the qualifications of provincial librarians may come about with consequent, long overdue improvement in provincial library service.

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TEACHING SCIENCE BY DISTANCE EDUCATION: A PERSPECTIVE

Geryk John

Introduction

The development of distance education in Papua New Guinea has been largely due to two separate establishments : the College of Distance Education which is run by the Department of Education, and the Department of Extension Studies which is part of the University of Papua New Guinea. The former has been largely responsible for distance education at secondary level for Grades 7-10, whereas the latter has been involved in the development of matriculation and some tertiary level courses (Gris 1974). The Department of Extension Studies as well as offering English, mathematics, arts and social science courses has introduced science courses in the last few years. However, these courses have been the least developed part of the extension programme and the average total number of enrolments for the last three years, up until the beginning of 1989 has been only about 50. There are good reasons for this low intake and I shall deal with them later in this paper.

The only courses offered at present are matriculation science subjects - chemistry, physics and biology. Originally the course was offered as a year-long programme with practical classes being conducted in a special Lahara (summer school) session, which took place during November/December each year. This required external students from various provinces coming to the University in order to carry out the necessary practical work. Then, in 1986, the course was divided into the individual subjects of chemistry, physics and biology and these are now run on a semester basis. A different course is offered for each of the two semesters, which lasts for approximately 18 weeks. In addition, the Lahara course has now been converted into an intensive week programme over the Christmas period and a single science subject can be taught within this time period. Thus a science student should be able to study all three subjects within a 12 month period.

Structure of the Science Courses

The course structure of the three subjects is largely the same, based on dividing the course into individual subject units. Students are given study guides for each unit of the course which they are undertaking. There are usually six units in the course. Thus for biology, these units comprise studies in: 'cell structure', 'ecology', 'structure and function of flowering plants', 'animal physiology', 'characteristics and classification of living organisms' and 'genetics and evolution'. Students work through these exercises in their own time and normally a period of at least ten hours private study per week is required. In addition, provision is made at University Centres located around the country for tutorial sessions lasting two hours which are held on a weekly basis, and at which students can discuss conceptual problems with their tutors and go over tutorial questions set out in their course materials. Assignments based on each unit are given to the students and a series of practicals are conducted throughout the course. The majority of these practicals can be carried out by the students themselves at home, and are essentially quite simple. In the case of biology a practical kit is sent out to each student comprising a dissection kit, as well as many odds and ends such as seeds for germination, herbarium sheets and Petri dishes. The type of biology practicals undertaken examines the structure of flowers and seeds, transport processes within the plant, simple observations on diet, and heredity to name but a few. Furthermore, there is a requirement for science students to attend workshop sessions which are held during the course. In the case of biology, three workshops are held dealing with plants and animal diversity. These workshops normally have to be held at weekends, as most students have full-time jobs during the week and in addition require the use of laboratory facilities. For students undertaking the course in Port Moresby, this does not prove to be too much of a problem because there are adequate laboratories within the various departments of the Faculty of Science, whereas at outlying provincial centres this may become more difficult.

Matriculation Students

The type of students enrolled in the matriculation studies programme come from all walks of life, and mainly comprise mature-age students, both unemployed and employed. The selection criteria normally applied by the department are given below:

(a) a person must be of 21 years of age;
(b) he or she must have a minimum of two years work experience;
(c) he or she should have passed Grade 10 to enrol for matriculation studies.

The following table gives an indication of the total number of students enrolled in matriculation studies since 1978, showing how numbers have changed over the years. The low figures for 1980-83 reflect the non-availability of arts and arts/mathematics streams. As mentioned previously, the average figures for science enrolments have been in the region of 50 per year since 1984.

Table 1 Enrolments in Matriculation Studies in the Department of Extension Studies, UPNG, 1978-1989

Year	Enrolment	Year	Enrolment	Year	Enrolment	Year	Enrolment
1978	800	1981	78	1984	359	1987	1 724
1979	545	1982	N/A	1985	529	1988	1 960
1980	152	1983	162	1986	1 053	1989	4 216

Problems with the Development of Science Courses

The underlying trend throughout Papua New Guinea which may also apply to other South Pacific countries appears to be a chronic shortage of scientifically-trained personnel, which may reflect a greater student preference for arts-based disciplines at the expense of the sciences. This preference may be based on three factors:

(a) a conceptual difficulty is grasping the fundamentals of science, due to some of the abstract principles involved. Arts courses such as history, anthropology or sociology are more easily related to one's own national culture and every day experience.

(b) a shortage of highly qualified science teachers throughout the secondary school system, together with a lack of sufficient equipment and laboratory space (caused by insufficient

Government funding), has meant that the standard of science teaching may be far from adequate and may discourage high school students from purusing a career in science;

(c) a perception that other subjects taught or disciplines entered, for example, commerce may offer better career opportunities in terms of employment, job satisfaction and financial reward.

Even vocations which in other countries, generate a high level of competitiveness in order to be accepted for training, for example medicine, suffer from the lack of interest in science. Thus in recent years it has become difficult to attract enough students into the Faculty of Medicine at UPNG in order to study to become doctors. Sadly, the majority of the students who apply to the University and are interested in pursuing a medical career, do not come up with the required grades and are turned away. Other related vocations such as dentistry, pharmacy, and veterinary Science have had a very low success rate, with students having to be sent overseas to study these subjects.

Although the above comments do not specifically apply to extension studies, I do believe that they are an underlying problem to the development of science-based courses in this country and may have some influence to bear on distance teaching in science.

The major problem associated with offering science-based courses has been to incorporate practical sessions into the programme. Previously the matriculation science course was year-long, with practicals held in a six-week intensive period during November/December. By devising simple practicals which can be done in the student's home and with the minimum of materials required, this can be achieved during the course, together with workshops held at the University Centre. The main difficulties are encountered with the outlying provincial centres. The workshops which are arranged require the use of laboratories in local high schools and prevail on the good will of the school authorities to allow access to the use of microscopes, glassware, and so on. This has limited the ability of provincial centres to run science courses in some cases.

At present, science courses are restricted to those provinces which have centres. However, there are a large number of potential students who would wish to do science courses, but who live in rural areas a long way from a centre. One possible solution to this problem might be to compile a collection of basic scientific equipment for one particular subject, which could be easily transported from one provincial site to another. For instance, if chemistry was being offered in Enga Province, then a collection of glassware and chemicals could be assembled for say, ten students, which would enable the course to be taught at a local high school during one semester, before moving on to an adjacent location such as Simbu Province for the following semester. Obviously this would require a large, initial financial outlay. Even more ambitious, perhaps, would be to have a mobile vehicle equipped with laboratory facilities, which could travel around the country.

A second problem, has been the availability of proper tutors. Science by its very nature necessitates the reliance on suitable tutors. Attempts to do science courses by correspondence have been a failure. Often a provincial centre will run one of the three science courses based purely on whether there is a tutor present to teach that course, rather than based on students' interest and numbers. Certain subjects such as physics prove more difficult to offer to students because of a relative lack of suitable tutors as compared to other sciences. The number of university students graduating in physics is much less compared to biology and chemistry.

A third problem, especially in relation to running courses in the provinces is a heavy reliance on a speedy mailing system. The courses usually have a strict timetable to adhere to and this may be totally thrown out of sequence, if the required materials do not arrive in time.
Another difficulty with running science courses, and which is not restricted to science alone, is the ability to get materials printed cheaply, quickly and in a format which is attractive to the student. The Department of Extension Studies relies heavily on the university printery in order to get its materials printed and bound, and this can lead to frustrating delays if the materials are not submitted well in advance of when they are needed, or the particular job is postponed while some other urgent job gets priority. Once again, the provincial centres are heavily dependent on the main University Centre in Port Moresby, because all the printing is done there.

Obviously, before the materials are printed, the course has to be written. Course advisers in the Department of Extension Studies are continously writing and rewriting courses. Most courses tend to be rewritten every three to four years on average, which is a very time-consuming process, roughly taking six months from start to finish. The science courses have been written from within the department, with the assistance of members of the Faculty of Science at the University. Future courses in more specialised science areas and at a more advanced level will require greater cooperation and input from university academics or high school teachers, in order for these courses to be written. When such personnel are already having to confront a heavy workload during their teaching semester, then this problem is further compounded and it is asking a lot of their goodwill.

Student Difficulties

The previous comments have all been in relation to problems with the running of science courses by university staff and tutors. No mention has been made of the party involved - the student. Obviously, they are directly affected by delays with materials or by problems associated with running the course. The students are very much on their own, despite the weekly tutorials and how well they perform is based on their own personal discipline in private study. Tutors and course coordinators have an important role here to provide encouragement to the student, who may begin to despair at coping with the workload imposed by the course. Hence, the insistence of the department on mature-age students to undertake these courses, who have a deeper personal commitment. Science courses also produce an inherent problem in the nature of the language used. Students may find difficulty in coping with and remembering the numerous scientific terms which need to be employed. This is a problem, I suppose, for students all over the world. However, it becomes more acute with students for whom English may not be a second, but quite commonly a third language. Possibly a short course aimed at a general overview of Science English may need to be introduced at some stage.

Problems with Funding

Another difficulty relates to the financial side of running science courses. This applies to both the student and the university department or provincial centre. The student has to pay a registration fee, which incorporates the cost of materials, as well as pay separately for a practical kit and the price of the recommended textbook. This can lead to a considerable outlay for students who are unemployed or may come from poor backgrounds.

For the university centres, there is a total reliance on the local provincial government for their funding, being quite independent of University finances. This prevails upon a commitment by the provinces to distance education and relies on their goodwill. Recently, a provincial government decided without any prior consultation to cut the budget of the local university centre by 40 percent, which now faces a real threat of imminent closure. The purchase of scientific materials is also a costly exercise, although since the materials such as dissection kits may be used by students and then returned to the centres, they are fortunately available for reuse. Science courses are far more costly to run from the equipment point of view, than say, language courses. Furthermore with the small size of science classes as compared to other subjects, science courses do not become cost-effective because the cost of hiring a tutor outweighs the student fees collected from such a small group.

The Development of Future Science Courses

Science is an area which urgently needs to be developed in terms of distance education within Papua New Guinea. There are several possible avenues which could be explored:

1. The externalisation of Foundation Year/Degree courses within the physical and biological sciences.
2. Involvement in technology-based courses.
3. Involvement in paramedical and medical sciences.

With regard to developing external science degree courses, it is unclear whether there would be a big demand for them, as students intending to do a degree would prefer to enrol full-time with the University. The biggest appeal for such courses might lie with students outside the University in the provinces. The difficulty with arranging adequate practical experience would be even greater and would necessitate reverting to the previous routine of holding classes at the end of the academic year. This would be disadvantageous in that students would be unable to relate the practicals to a relevant topic under discussion, and result in a loss of momentum in that particular course. The length of time taken to pursue a whole science degree under those circumstances would therefore be quite lengthy. The Open University in the United Kingdom probably offers the best experience of organising such degree programmes.

The second area, that of technology, is a comparatively untouched field in relation to distance education in Papua New Guinea. Countries, such as UK, Australia, Sri Lanka and Pakistan have developed such courses with some success, and technology courses deserve close consideration in Papua New Guinea. Possibly the two subjects which would benefit mostly from distance teaching might be fisheries and agriculture, because these are two important technological areas which encompass a sizeable proportion of the rural population. The University of Papua New Guinea's close involvement with these subject areas could be a useful opening to start developing courses in some aspects of fisheries and agriculture.

The third area is one which I am personally interested in and may offer some worthwhile opportunities. In the field of paramedical sciences, there are various institutions throughout Papua New Guinea, for example, the Colleges of Allied Health Sciences, which are duplicating certain programmes towards paramedical training. There appears to be a lack of liaison between these institutions in achieving a common standard or course content, as for example, in biochemistry required to be undertaken as part of a medical technician's course. Possibly this is the type of area in which a certain amount of 'streamlining' could be introduced by the Department of Extension Studies.

Alternatively, courses which are already being run by the university centres, such as advanced English courses, could be offered to students in these institutions in order to upgrade their level of education. One category of paramedical staff for which this would be most suited would be community health workers. These men and women work in very remote rural areas and are the mainstay of adequate medical care in these areas. These staff have very basic paramedical training, in some cases extending to performing simple surgery, incorporating the role of general practitioner and nurse combined together. Possibly these orderlies could be involved in existing extension courses or would benefit from various paramedical teaching materials sent out to them. Similarly in the area of pharmacy, there are very few properly qualified Pharmacists in outlying areas, but there is a reliance upon pharmacy dispensers. These paramedics do training in the basic medical sciences with a fairly elementary knowledge of dispensing and preparing drugs, and learning how drugs work. At present, there is a dispensers' programme run at the Port Moresby General Hospital, which requires students to come in from all over the country and which is normally heavily oversubscribed. Perhaps, this is an area which would lend itself to external teaching by correspondence, although the problem with practicals would remain but this would not be insuperable.

For the medical sciences themselves, there are obvious problems with the complexity of the subject involved. At present the Medical Faculty of the University of Papua New Guinea offers a Master of Medicine course for qualified doctors wishing to study specialist areas of medical knowledge. This has been offered externally to doctors working in rural hospitals but the success rate has been low. Possibly the preparation and despatch of distance teaching materials to these doctors would assist greatly with their programme. Another approach for distance teaching in medical education could take the form of a non-formal type programme. Such a system has been used with some success in the United States, notably at the University of Indiana. Medical doctors enrol in a programme which has no fixed qualification at the end of it, but entails materials being sent out to them on various medical topics and the doctors are able to assess themselves, by means of questions on sections of the material which they cover. An example might be a booklet on the treatment of asthma, for instance whereby the causes, symptoms and drug treatment would be covered by means of suitably written study guides. Using a points score system, doctors could get some idea of how their knowledge compares and at the same time bring themselves up to date with current trends. Such an approach might prove valuable to distance medical education in Papua New Guinea.

New Trends in Science Education

Earlier in this paper, I discussed the problem of low numbers of students in science courses. This is a problem which must be redressed in order to attract students into these programmes. This might be achieved by making the courses more exciting to the students, for example, by using materials which are visually more interesting, or the use of visual media such as videotapes which bring the subject more alive. In some way, the sciences need to be taught in such a way as to be relevant to everyday life for the Papua New Guinean student. This process needs to start at a much earlier stage than the distance education level. A much greater commitment is required by the government and the Department of Education to ensure that the standard of science teaching is improved in the nation's high schools. Possibly the Advanced Diploma Unit in Goroka could have an important role in reviewing the situation of science teaching in schools at present and encouraging more teachers to take a Science option during their teacher training.

New technology is very important in regard to improving the quality of science teaching. The use of videos has already been mentioned. The introduction of computers to assist in the learning process is a possiblity in the near future because many high schools throughout the country have access to computer hardware. Word processors and laser printers are similarly being employed at the materials preparation stage and are improving the quality of students' course materials. Television has recently been introduced into Papua New Guinea and this offers the opportunity to show educational programmes in science subjects.

Another area which would greatly assist distance teaching in science would be an improvement in telecommunications which could make science tutorials in remote, rural areas more feasible. The obvious model in this regard is the University of the South Pacific, which has a satellite telecommunication link-up with all its university centres scattered throughout the various island nations of the South Pacific. Students are linked up by telephone to their tutor at weekly study sessions and are able to discuss problems they may have encountered without the tutor being physically present. A similar system operates in some outback areas of Australia. Generally speaking, closer cooperation is needed with countries in the South Pacific region, particularly Australia, New Zealand and Fiji with regard to utilising their greater past experience in distance education as well as the establishment of useful contacts in the future. The newly established Commonwealth of Learning could have an important role as a depository of information on distance teaching in science and other subjects throughout the Commonwealth countries.

To conclude, science teaching by extension in Papua New Guinea is in its early stages of development at present, but there is a great opportunity to expand into various areas throughout the country. A system of university extension centres is already in existence and it is hoped that eventually each province will possess its own centre. This is an exciting area for us working within the distance teaching framework and offers a challenge which we should not hesitate to take up and work for the improvement of education standards within Papua New Guinea.

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THE PROCEEDINGS OF THE SECOND RESEARCH IN DISTANCE EDCUATION SEMINAR HELD IN 1991 AT DEAKIN UNIVERSITY WILL BE AVAILABLE IN EARLY 1991

CONTACT DR. TERRY EVANS OF THE INSTITUTE OF DISTANCE EDUCATION, DEAKIN UNIVERSITY, WAURN PONDS, VICTORIA, AUSTRALIA FOR MORE DETAILS

DISTANCE EDUCATION IN PAPUA NEW GUINEA: ACCESS, EQUITY AND FUNDING ISSUES AT THE COLLEGE OF DISTANCE EDUCATION AND THE UNIVERSITY OF PAPUA NEW GUINEA

Dikana Kema and Richard Guy

Distance education in Papua New Guinea is relatively small compared to the organisation of distance education in other developing countries but this needs to be kept in perspective as the country's total population is just 3.5 million people. The main thrusts at present in distance education in Papua New Guinea are courses for Grades seven to ten, and studies in commerce offered by the College of Distance Education (Shaw 1986), and matriculation studies together with foundation university courses, and degree and diploma level courses in Education, Arts, Law and Commerce offered by the Extension Studies Department of the University of Papua New Guinea (Kaeley 1989).

The Emergence of Distance Education in Papua New Guinea

College of Distance Education

Correspondence education began in Papua New Guinea in the 1950s with the establishment of the Correspondence School which provided locally developed Grade five and Grade six courses for indigenous public servants, and the provision of higher level courses from the Queensland Correspondence School for expatriate workers and their children. In 1959 the school had an enrolment of some 800 students. In 1964 all courses were replaced by new courses developed within the country. The Correspondence School was transferred to the Adult Education Branch of the Department of Education in 1967 and became known as the School of External Studies. Enrolments increased rapidly in the 1970s as conventional secondary education was introduced on a wide scale throughout the country and adults looked for a suitable alternative in which to follow similar studies. By 1972 enrolments in courses from Grades seven to ten and in mechanical, carpentry and building trades and in commercial subjects exceeded 22,000 in number. Demand was so high for courses that the school could not cope, and in 1978 when the school became the College of External Studies, it was decided to withdraw all technical and Grades seven and eight courses and to offer only Grades nine, ten and commercial courses (Field 1981). This reduced enrolments significantly but demand continued for the withdrawn Grades seven and eight courses which were reintroduced in 1980 and 1982 respectively. The name of the college was changed again in 1988 to that of the College of Distance Education and enrolments have expanded each year (see Graph 1). All along, the purpose of the College of Distance Education has been the provision of an alternative means to gain lower secondary education qualifications. Earlier on, enrolments were made up of older public servants needing to upgrade their academic qualifications. More recently, there has been an increase in the number of younger enrollees who wish to continue secondary education but are unable to gain one of the scarce conventional high school places. There are just 16,000 places available for the 47,000 students who complete Grade six at community school each year and who want to proceed to high school, and just 1,200 places available for the 10,000 Grade ten students who wish to proceed to Grade eleven studies. The college courses follow the National Department of Education's high school curricula, are academic and lead to the external Grade ten examination as taken by mainstream high school students.

Extension Studies Department - University of Papua New Guinea

Monsell-Davis and Naidu (1989) remind us that tertiary education was late coming to Papua New Guinea with the establishment of the University of Papua New Guinea in 1966. Distance education is an even more recent phenomenon at the tertiary level beginning in 1976 despite the early rhetoric of the Currie Commission (1964:243) which recommended the establishment of an extension studies department at the university, '.... if suitable potential students cannot go to the University, then the University must go to them'. Despite this, the view of the University of Papua New Guinea has hardly been encouraging judging by Healey's (1978:12) statement that 'no more than token support existed' for the Extension Studies Department. Over time, this attitude has hardly altered, '.... there was in a few departments at UPNG a lack of cooperation which degenerated into obstruction of outreach activities' (Griffin 1984:323). The economic rationalists at the university had only to look at course enrolments in the early 1980s for sufficient evidence to abolish the department (see Graph 2). Instead the University appointed a Director of Extension Studies in 1985 who had first hand experience in distance education and was a vociferous advocate of this form of education. Enrolments with the Department expanded rapidly from this time and Crossley (1989) puts forward evidence to suggest an awakening of interest within the University for the Department of Extension Studies, although resource limitations and subsequent effects on staffing continue to constrain its expansion (see Table 2).

The objectives of the Department of Extension Studies relate unequivocally to a national development strategy which aims to 'generally improve education standards throughout the country' but targeting those within the existing workforce to 'give mature people a chance to improve their qualifications and skills, thus compete for promotions at work' at 'a low cost to students and the government by saving on scholarships, accommodation and capital costs'. The Department also expresses a concern to further the education of women (Extension Studies Handbook 1990:1). Recently the Department of Extension Studies Five Year Plan (1988-1993) has established a set of internal objectives which represent an admission of shortcomings in its practice which require attention. These objectives concern improving its relationships with other university teaching departments in order to improve the quality of materials; to produce more course offerings which will contribute to greater course enrolments and greater cost-effectiveness; to share resources with other distance institutions in the region; to expand university provincial centres; and to strengthen the Department's commitment to continuing education and support structures for students. Despite this level of internal critical reflection by the Department, there has been little critique of the goals of distance education at the national level by the two major institutions offering distance education in Papua New Guinea. The objectives remain consistently oriented to national development through the upgrading of academic skills amongst members of the workforce.

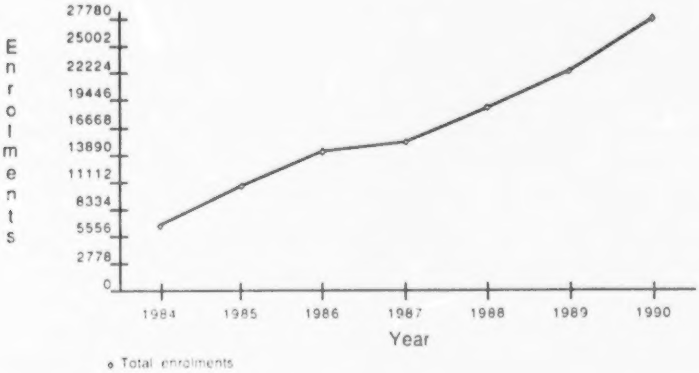
What have been the achievements of distance education to date in terms of providing an alternative route to secondary eduction? Has distance education, for instance, increased access to education given the large number of school graduates who are unable to proceed to the next phase of conventional schooling?

Access and Distance Education

College of Distance Education

The enrolment figures for the College of Distance Education (see Graph 1) show consistent growth over the past decade and the college's enrolment figures of 27,780 for 1990 in Grades seven to ten make it the largest secondary school in Papua New Guinea, and represents more than one half of the combined enrolments of all of the high schools in the country at some 52,555 students (PNG Department of Education 1990).

Graph 1:College of Distance Education - Total Enrolments 1984-1990 (Source: College of Distance Education).



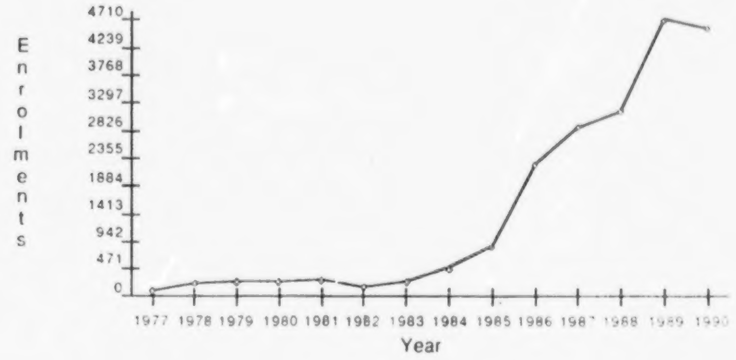
This growth in enrolment figures has been dramatic and has come about as a result of the re-introduction of courses in 1980 and 1982, the establishment in 1984 of college provincial centres in all nineteen provinces of Papua New Guinea, and the establishment of student support structures, such as counselling and tutorial assistance through these provincial centres. The growth also reflects the expectation held by politicians and educational planners that distance study would absorb a significant number of students, who would otherwise be denied conventional educational opportunites.

The fee structure of the college is deliberately set at a level slightly below the cost of conventional education to make distance study attractive to potential students. Nonetheless, the cost is high relative to the rural basic wage for adults in Papua New Guinea. A fee subsidy scheme has been established by the government for disadvantaged distance students which is administered by provincial centre staff but the total funds available are small and are rationed on a provincial basis.

Extension Studies Department - University of Papua New Guinea

The Department of Extension Studies has also embraced a significant increase in student enrolments in recent times. The growth in extension studies enrolments has been quite dramatic from 1986 onwards and the department has a greater enrolment in 1990 at 4,585 than the combined total enrolments of 4,200 of the University of Papua New Guinea's other teaching departments. The 1990 figure is lower than the preceding year but this is the result of staffing difficulties at one of the provincial university centres and civil disorder in several provinces of Papua New Guinea.

Graph 2:UPNG Extension Studies Department - Total Enrolments 1977-1990 (Source: Extension Studies Department).



This growth in enrolments has been achieved mainly as a result of the appointment of a new Director to the department in 1985 from the University of the South Pacific who abandoned the previous restrictive entry policy. This policy required extension students to be 21 years of age and to have had a minimum of two years work experience. It was replaced with an open entry policy, and at the same time the number of course offerings available was increased and the establishment of university centres was vigorously pursued.

The courses which attracted substantial increases in enrolments were those in basic studies, prematriculation and matriculation programmes. Eight matriculation courses have to be successfully completed in order to gain entry to university. These courses can be done within a two year period which is the same time that it takes to complete Grades eleven and twelve at any of the four national high schools in Papua New Guinea. In addition the total fee charged for eight extension studies courses is less than the total fee that is required for attendance at a national high school. Matriculation courses through extension studies are cheaper and just as quick to complete as the conventional route to university entrance. The expansion of matriculation courses has been a planned move by the University to increase, in the long term, the potential matriculants to university, although this should not disguise the fact that levels of cooperation within the University to externalise tertiary courses have not always been satisfactory. Prior to 1988, the major tertiary institutions in Papua New Guinea offered preliminary studies to Grade ten students which provided them with an intensive one year, full-time matriculation programme because the output from the national high schools was too low to satisfy the numbers required to justify existing tertiary courses. These courses were abolished during a period of tertiary funding cutbacks which saw the University of Papua New Guinea's budget cut, for instance, by 40% in real terms between 1986 and 1990 (UPNG Planning Committee 1990).

The growth in student numbers in extension studies is in matriculation courses rather than in tertiary education courses. In 1990, the Department of Extension Studies had only 361 students enrolled in tertiary courses. The Gris Committee (1974), which provided the impetus for the establishment of the Department of Extension Studies, advocated the broadening of higher education through distance study but this has not been achieved so far because few programmes and courses exist at the university level. This is a serious shortcoming and has been recognised by the Department in its five year (1988-1983) developmental plan. In the meantime, the prominent role for the Department of Extension Studies for the foreseeable future will continue to be the provision of an alternative route for students to gain entry to university.

The expansion in student enrolments in distance education courses at the secondary level have substantially increased access to higher levels of education in Papua New Guinea. In addition the establishment of the College of Distance Education and the University provincial centres throughout the country has increased access to education for isolated rural students rather than simply providing access for those who can attend urban provincial centres. This has resulted in a similar number of distance students from isolated areas undertaking secondary and matriculation studies as the number of students enrolled through the urban based provincial centres.

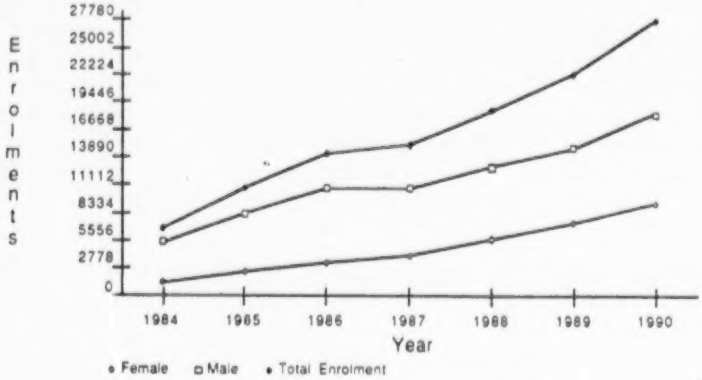
Equity and Distance Education

College of Distance Education

National participation rates for females in conventional education in Papua New Guinea have always been low. Participation rates are dependent on the level of education and geographic location (Swatridge 1985). Provinces such as the National Capital District, Manus and East New Britain, for instance, have participation rates by females at community school approaching one hundred percent of the relevant age cohorts, whereas provinces such as East Sepik and Southern Highlands have quite low rates. Female participation rates deteriorate markedly the higher the education level that is under consideration and the overall female enrolment figure for provincial high schools is 39% in 1990 (PNG Department of Education 1990).

The participation rates of females enrolled in secondary studies at the College of Distance Education as indicated in Graph 3 are poor in comparison to the high school rate although they have increased from 21% in 1984 to almost 30% in relation to total enrolments in 1990. It remains to be seen if this upward trend will continue. The College of Distance Education figure suggests that distance education has some ground to make up if it is to be a significant factor in the improvement of female participation rates in education in Papua New Guinea.

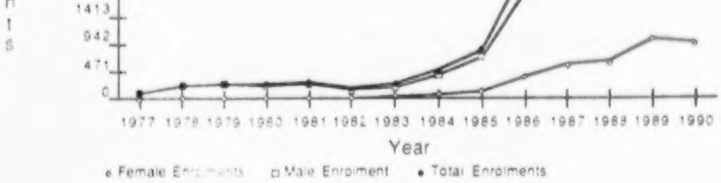
Graph 3: College of Distance Education - Female Enrolments 1984-1990 (Source: College of Distance Education).



Extension Studies Department - University of Papua New Guinea

Participation rates of females enrolled with the Department of Extension Studies of the University have shown some improvement over the past decade.

Graph 4: UPNG Extension Studies Department - Female Enrolments 1977-1990 (Source: Extension Studies Department).



The department can claim some success 'to further the education of women' by improving participation from 5% in 1977 to 24% in 1990. Nonetheless the figure remains disappointing but it is consistent with the overall university female participation rate of 23% in 1990.

Mandie-Filer (1988) discusses the pedagogical and social constraints on female participation in conventional forms of education at the secondary and higher educational levels and suggests that distance education can be an effective alternative form of education for women in Papua New Guinea. Despite its potential to democratise educational opportunities for women, distance education has failed to do so in Papua New Guinea. Distance education may offer a satisfactory pedagogical alternative for women in Papua New Guinea but the continuing strength of social forces, such as the negative attitudes of males and uneducated females to women and educational achievement, are major hurdles still to be overcome.

Funding of Distance Education

College of Distance Education

The funding of the College of Distance Education (CODE) has shown some small improvement in real terms over the past few years. In 1983 it was K422,000 (Matane 1986) but despite the significant increase in enrolments it has generally been neglected in terms of staffing and funding by government.

Table 1: National Department of Education - Enrolment and Expenditure by Sector 1990 (Source: National Department of Education).

Sector	Enrolment	% of Enrolment	Expenditure (Kina)	% of Expenditure
Primary	402,948	82.04	7,802,900	37.74
Secondary	55,057	11.21	11,522,100	55.74
Non-formal	5,395	1.10	703,800	3.40
CODE	27,780	5.65	644,100	3.12
Total	**491,180**		**20,672,900**	

The National Department of Education has a policy of targeting sectors of the education system through World Bank loans to upgrade the overall quality of that sector of education. The provincial high school system has been targeted in 1990 which explains the large expenditure of money on that sector. There are no plans in the near future to target distance education in a similar way. It is discouraging that despite the size of college enrolment at 5.65% of the total education sector enrolment, it attracts a less than proportional share of the overall education budget at 3.12%.

The unequal distribution of funds calls into question the continuing role of the college. Its physical location and staffing levels reflect the small financial allocation that it receives. The use of the majority of resources in the formal education sector probably explains a great deal more about the views of government and education planners towards their conception of national development, and the maintenance of existing relationships within society, than about the role of distance education in Papua New Guinea.

Extension Studies Department - University of Papua New Guinea

Graph 1 indicates that 4,710 students were enrolled with Extension Studies in 1989 which was larger than the combined enrolments of 4,142 of all of the other teaching departments at the University of Papua New Guinea in the same year. This would suggest the need for some equity in the allocation of University funds.

Table 2 indicates the 1989 allocation of funds within the University in which the above enrolment figure for Extension Studies has been divided by two to achieve an equivalent full-time student number. This has been done to portray the 'least effect' of external students and to satisfy those who argue that distance students require less attention than full-time, on-campus students. The expenditure figure for extension studies includes the cost of salaries of main campus staff but not the allocation of monies to the university centres which is provided by provincial governments rather than the University. Even with the inclusion of the funds provided by provincial governments the percentage of expenditure available to the Department of Extension Studies increases to 8.34%.

Table 2: UPNG Department of Extension Studies-Enrolment and Expenditure by Academic Departments 1989 (Source: UPNG Planning Office).

	Enrolment	% of Enrolment	Expenditure (Kina)	% of Expenditure
Extension Studies	2,355	36.25	326,000	5.17
All other UPNG teaching depts.	4,142	63.75	5,984,184	94.83

It is difficult to explain the allocation of finances within the University. The Director of the Department of Extension Studies is not a member of the University Finance Committee, which needs to be addressed, nor does the University contribute to the cost of printing extension studies materials in its allocation to the department. Printing costs are paid by students through a special levy contained in the course fee which tends to discriminate further against the unemployed.

Although Crossley (1989) was able to locate some awakening of interest by the University of Papua New Guinea in Extension Studies, and despite the increase in student enrolments, the funding relationship with other university teaching departments is depressingly poor. The implications of this level of funding have translated themselves in recent years into considerable stress for all existing extension studies staff who have had to take on heavier workloads. The extent of course development has been substantially reduced, for instance, as course writers take on increased administrative loads.

Conclusion

Distance education in Papua New Guinea is dominated at present by two institutions which have succeeded in providing a successful alternative route to secondary education within Papua New Guinea. This improvement in access, as indicated by steeply rising enrolment rates is unequal, and the participation rates of women in distance education programmes remain poor. Despite the significant contribution that distance education is making to overall participation rates in education in Papua New Guinea, funding authorities have been reluctant to increase the funding of distance education to match its growth. As a result the theory and practice of distance education in Papua New Guinea remain underdeveloped and underutilised.

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THE PAPUA NEW GUINEA ASSOCIATION FOR DISTANCE EDUCATION: BACKGROUND AND PURPOSE

Michael Monsell-Davis

Distance Education, which can be defined as formal study based largely on the physical separation of the student and the teacher, began in Papua New Guinea (PNG) in the late 1950s with the foundation of what is now known as the College of Distance Education (CODE). The Correspondence School, as it was then called, mainly served PNG public servants, but many overseas administration personnel such as school teachers and patrol officers continued their education through Australian-based distance education institutions such as the Queensland University.

Papua New Guinea gained independence in 1975, and over the following years there were increasing pressures to provide better education to people in dispersed communities and remote areas, and to upgrade the skills of those already in the workforce. A number of educational and training institutions took up the challenge and began employing distance education methods for all or part of their training programmes. Among these were CODE, UPNG's Department of Extension Studies, Goroka Teachers' College Advanced Diploma Unit, the Pacific Adventist College, the Department of Health, and Post and Telecommunication. Others such as the PNG Electricity Commission and the Police Department, were either planning their own distance education programmes, or making use of existing programmes such as those of CODE or UPNG.

In addition, increasing numbers of institutions based in the USA, UK, New Zealand and Australia are advertising through the PNG press. While many of these bodies are of excellent quality, their courses often do not fit PNG's needs at this time, and their fees are very expensive for PNG Students. While those institutions within PNG have tended to work in isolation from each other, and commonly with limited access to new skills in the preparation of distance teaching materials, other forces have been operating to draw them together to share experience and materials.

In 1985, UNESCO sponsored a regional workshop on the preparation of distance education instructional materials at the Sukhothai Thammathirat Open University in Thailand. One of its concluding recommendations was that each member country should establish coordinating body to monitor standards and coordinate the distance education activities of various institutions (UNESCO 1985:35). The following year, an in-country workshop held at UPNG's Department of Extension Studies concluded that while distance education was providing opportunities for a wide range of students in age and experience there remained a strong male, urban bias; a need to stimulate cooperation between distance education bodies to obviate duplication and unnecessary competition; a need to diversify courses to cater for the differing needs of adults and young people; to open up new areas of education and training; and a need for the training of PNG personnel in relevant distance education skills. The major recommendation from the workshop was:

> that a professional association of distance educators in PNG be established and charged with the responsibility to plan appropriate programmes of cooperation, training and course production (Department of Extension Studies 1986:12).

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In 1987, a series of meetings association with the NDOE Task Force G (College of External Studies) made the strong recommendation:

> that a distance education exchange be set up to bring about better communication between agencies, and more economic use of scarce resources, especially human (National Department of Education 1987:61).

The common theme emerging from these meetings and workshops was the belief that distance education is a cost-effective, non-disruptive means of upgrading the skills and qualifications of national personnel in both urban and rural areas. Distance education can provide a useful input to government policies regarding rural development and non-formal education, both in developing materials and in the training of trainers.

The various recommendations led to initiatives by the National Department of Education, and the University's Department of Extension Studies, for a meeting of interested bodies. In 1989 a number of institutions, concerned in some ways with distance education were invited to the annual meeting of university centre directors to discuss the possibility of forming a PNG Association for Distance Education. Between 1987 and 1989, a number of preliminary meetings were held. The principal participants were Michael Monsell-Davis and Angela Mandie-Filer of UPNG: Tim Poesi and Graeme Monkley of NDOE; and Bev Martin and Dikana Kema of CODE. Acknowledgement needs to be made of Tim Poesi's continual prodding of other participants to keep the momentum going. The participants agreed that there was a wealth of experience in distance education methods in PNG, but that most practitioners were unaware of each other's work. The common problems and themes emerging from the discussion concerned the production of suitable course materials; overlap between institutions; appropriate systems for the delivery of instructional materials to students; general communication problems with students; and the need for support and incentive systems for students such as that provide by provincial centres and study groups.

More importantly, the participants endorsed the earlier recommendations for a National Association of Distance Education, and elected an interim committee to develop a set of aims and a constitution for such a body. After much deliberation, the interim committee prepared a constitution, which was adopted at the foundation meeting on 15 March 1990. The constitution lists the Association's aims: to promote distance education in PNG; to foster a wider public appreciation of distance education, and its potential in contributing to the national goals of PNG; to establish links with relevant overseas associations; and to assist in identifying sources of aid and funding. The Chairman of the Interim Committee, and first President of the Association, was Laurie Mientjes of the Pacific Adventist College. Laurie worked extremely hard and enthusiastically during this period to establish the Association and prepare it constitution.

Among its more specific activities, the Association is: to encourage links between distance teachers and resources and expertise; to assist in evaluating each other's programmes for possible cross-crediting; and to disseminate general information on programmes and resources. In this context, the Association will need to be prepared, where necessary, to evaluate all distance education programmes advertised and/or operating in PNG.

In terms of training, the Association intends to arrange and coordinate seminars, workshops and general training in order to promote the development of distance education in PNG, and to encourage PNG national personnel to acquire expertise in distance education techniques. The first workshop, for example, was held during 1990. Titled 'Making Text Readable' its intention was to assist course developers to assess and modify the readability of texts.

Another function of the Association, although this is not explicity stated in the constitution, will be to monitor changing educational and training needs in the country, and to make proposals that may include the abandoning of outdated programmes and the introduction of new programmes. For this, the Association will need to keep in touch with policy makers and government authorities, as well as with business agencies and non-government organisations. It will also need to liaise with international bodies such as the Australia and South Pacific External Studies Association (ASPESA), the International Council for Distance Education (ICDE) and the Commonwealth of Learning.

It has been a slow process, but over the last fifteen years, growing numbers of people have been attempting to improve their educational qualifications and skills through distance education. Partly in response to this, and partly because of the high costs of formal education, more and more bodies within PNG have come to appreciate the value of distance education as a means of upgrading the skills of their employees, and a as a means of keeping their personnel in remote areas in touch with new developments in their field.

Alongside this growth has been the need to share distance education expertise, to exchange information, to train PNG personnel in relevant skills, to monitor new needs in the light of both government policy and changing economic circumstances, and to maintain contact with relevant international bodies. It is in response to these needs that the PNG Association for Distance Education has been established.

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NEW PUBLICATION

BEYOND THE TEXT: CONTEMPORARY WRITING ON DISTANCE EDUCATION

TERRY EVANS AND BRUCE KING (EDS.) 1991

This book brings together a collection of contemporary writing on distance education which is both provocative and stimulating, and which makes an important contribution to national and international debates about distance education. There are substantial discussions of the nature of distance education and its relation to disability, developing nations, gender, technology, autonomy and independence.

PUBLISHED BY DEAKIN UNIVERSITY PRESS,
GEELONG, AUSTRALIA.

IN SEARCH OF AN EFFECTIVE ENGLISH LANGUAGE PLACEMENT TEST FOR EXTENSION STUDIES AT THE UNIVERSITY OF PAPUA NEW GUINEA

Angela Phillip

The cloze test is chosen as the most appropriate type of language placement test for Extension Studies because it is the best test of overall language competence and because objective marking is required by the distance education operation. A new placement test is constructed and trialled to compare limited acceptable word scoring with exact word scoring and to compare the new test with the old entry test. Limited acceptable word scoring turns out to be more appropriate because it discriminates better than the exact word method. In addition the new test is compared with the old entry test and is found to be both more valid and far more reliable.

Introduction

The language courses offered in Extension Studies at U.P.N.G. range from pre-matriculation (i.e. gr 10 - 11), through matriculation (gr 12) to Foundation Year level. Each semester approximately 1,500 students apply for entry to one of these courses, so it is necessary to provide an efficient placement test in order to assess the students' current level of English proficiency. The students can then be directed to restart their education at a level which is appropriate for them.

Why a placement test is needed

A placement test is needed because although a grade 10 pass is the minimum entry requirement, it is not possible to use grade ten results as a basis for selection. There are three reasons for this. First of all the grade ten examination grades cover a wide range of ability, so that the proficiency of two people with the same grade could vary considerably. Secondly the grade ten examinations are norm referenced, so that the actual level of each grade may vary to some extent from year to year. Thirdly and more importantly, it must be taken into account that the majority of students have a gap of one or more years between completing grade ten (or possibly grade 12) and applying to Extension studies. During this time their English may become either better or worse. Often it gets worse.

What a placement test for Extension Studies is required to do

- It needs to test overall proficiency in English.

- It needs to be reliable.

- It needs to be a satisfactory predictor of success in language courses.

- It needs to be a test that can be marked by non-English specialists.

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The first three requirements would have to be met by any English language entry test. The fourth requirement, however, that the test should be capable of being marked by non-English specialists, is a constraint dictated by the needs of the distance education operation at U.P.N.G.

The Extension Studies Programme is organised through a network of University Centres (there are ten so far) which have been set up round the country to provide a local point of contact and support for students who learn at a distance. These are places where people can register as Extension Studies students. At present most registrations are unmatriculated students who have to take the entry test. It would be unwieldy and inefficient to have to send all placement tests to UPNG main campus for marking.

It was this fourth requirement, the need for objective marking, that provided the main impetus to replace the old entry test. The old entry test had several drawbacks, but the major one was that it could not be objectively marked and thus was not suitable for marking by Centre Directors who are not necessarily, and not usually, English specialists.

Problems with the old entry test

The old entry test consisted of three sections: reading comprehension (10 marks - 40%), vocabulary (5 marks - 20%) and free writing (10 marks - 40%). Both the second and third sections had serious problems.

First of all, the Vocabulary Section was not valid. It tested only five items of vocabulary, so although there was an objective marking scheme and the test was reliable, it cannot be said to be valid. Five items cannot be considered sufficient to judge the extent of a student's vocabulary.

Secondly there was the problem of the Free Writing Section being marked by subjective impression. This was the biggest problem. It was impossible to standardise the marking for this section because the markers are isolated from each other and the majority of them have not been trained for such tasks.

In addition to this, there was the problem of determining whether or not the test actually tested overall proficiency in English. There appears to be no evidence, for example, to suggest giving 20% of a language proficiency test to a vocabulary section. In view of these problems, it seemed necessary to consider what kind of a test could satisfactorily meet the requirements outlined above.

Choosing and constructing the most appropriate kind of language test

It was necessary to devise a test that measured overall language proficiency and could be marked objectively.

There were two possibilities: one was to devise a discrete point test i.e. testing skills separately by sets of questions; the second was to devise an integrative test which means testing language as a whole rather than separating out particular skill components.

Using a discrete point test was rejected for two reasons. The first is that there is as yet no agreement on how to weight particular language skills in relation to each other. Such a test would involve coming to a conclusion on a) which elements of which skills to include and b) how important they are in relation to each other, i.e. what percentage of marks should be given to grammar versus vocabulary versus reading comprehension etc. The second reason is even weightier and it is this. There is serious doubt that it is possible to measure overall language proficiency by separating out elements of language skills. The sum of the parts does not seem to equal the whole. This is not surprising given that we do not understand how the elements of language skills fit together and are not even sure that we have identified all the elements involved.

The other option was to use an integrative test and there are only two forms of integrative test capable of objective marking. One is dictation, which had to be rejected because of the impossibility of standardising the administration of such a test. The other is the cloze test.

A cloze test consists of a reading passage where every nth word has been deleted. The examinee has to fill in the blank spaces with suitable words. To fill in the blanks the examinee has to do two things: first of all the person has to understand the passage, and secondly he or she has to produce a suitable word which is acceptable both from a grammatical and from a content point of view to fit in the space.

In the past, researchers have argued about whether the cloze test is sensitive only locally at sentence level (Davies 1973, Shanahan, Kamil & Tobin 1982, Markham 1985) or whether it is sensitive to context across the whole reading passage (Oller 1979, Caulfield & Smith 1981). It seems, however, from a recent study (Jonz 1990) which analysed 8 cloze passages published over the last 15 years that the standard fixed ratio cloze does measure sensitivity to the whole text both grammatically and also for choice of vocabulary. The study also shows that standard fixed ratio cloze tests are consistent in the way they measure language knowledge.

Cloze tests seem to be generally reliable according to a summary of reliability figures taken from seven research studies by Brown (1980:312). Six of the seven reliability coefficients quoted were above .78. Brown also summarised cloze concurrent validity results obtained by nine research studies which had correlated cloze tests with established language tests such as TOEFL, A.U.B. English Examination etc. A range of .63 to .89 was reported. Such high correlations between cloze tests and the various subtests of accepted English proficiency examinations have been the cause of the belief that the cloze test is a test, not merely of reading comprehension, which was why it was developed, but of general language proficiency.

It seems that the cloze test is reliable and suitable for measuring overall language competence and that, provided either exact word scoring or limited acceptable word scoring are used, the cloze is capable of being marked objectively. For these reasons the cloze was chosen as the most appropriate language placement test for Extension Studies.

Four reading passages were chosen, one fiction and three non-fiction. The passages were graded according to familiarity of content and reading level.

Passage No 1 was the most culturally familiar as the story was set in PNG. The other passages were general non-fiction and not specific to PNG although it was anticipated that the concepts of perfume making (No2) and birds finding their way home (No3) would be more familiar to a PNG audience than would space travel (No4). The more familiar the content, the easier the test.

The readability levels of the passages measured by the Fry Readability Index were:

Passage No 1 PNG fiction - Gr 7

Passage No 2 History: Perfume Making - Gr 9

Passage No 3 Science: Birds' Homing Instinct - Gr 10

Passage No 4 Science: Space Travel - Gr 12

The passages were turned into cloze tests by deleting every 7th word. Occasionally exceptions were made when the 7th word was not suitable for use as a test item e.g. where a proper name was involved. At least one sentence at the beginning and the end of each passage was left free of deletions. Each passage carried 25 deletions.

Both exact word scoring and limited acceptable word scoring methods were used to see which worked best. The exact word (EW) answer key was drawn up by listing the words originally deleted form the passages. A limited acceptable word (LAW) answer key was drawn up by three native speakers. This listed the best alternatives for each item in the passages.

Trialling the new placement test

To compare exact word and limited acceptable word scoring methods

i) by calculating correlations to investigate whether both methods seem to be testing the same thing

ii) by carrying out item analysis to discover which scoring method is superior from the point of view of facility and discrimination

To compare the old entry test with the new placement test

Subjects

Eighty students entering Extension Studies in Semester 1, 1990 took both the old entry test and the new placement test. The sample was made up exclusively of students residing in N.C.D. There were 80 students in the sample, 61 were male and 19 were female. It must be noted, however, that all the students had already been accepted for courses on the basis of the old entry test. For administrative reasons, it was not considered possible to take a sample of the whole population normally encountered by Extension Studies, as this would have involved giving prospective students an extra hour's test in addition to the two hours (1 hour maths, 1 hour English) that was already required of them. It must be emphasised at the outset that the sample excludes approximately the bottom 25% of the population normally tested by Extension Studies for entry into courses. It is approximately the bottom 25% of applicants who are rejected and advised to upgrade their English at the College of Distance Education.

Method

All the students took the old entry test first (one hour), followed by the new placement test (one hour). There was a gap of approximately three weeks to a month between students taking the old entry test and taking the new placement test. This time lapse, however, took place before classes started and there was no teaching during this time. All tests were done under normal test conditions.

Scoring - The old entry test

The old entry test was marked according to the marking scheme provided i.e. objective marking for section 1 (reading comprehension - 10 marks) and section 2 (vocabulary - 5 marks) and subjective impression marking for section 3 (free writing - 10 marks). There was a total of 25 marks.

The new placement test

The test was marked in two different ways - by exact word and by limited acceptable word scoring methods.

Exact word scoring, designated the EW version of the cloze test, is where the answer is correct only if the student supplies the exact word that was used in the original passage.

Limited acceptable word scoring, designated the LAW version of the cloze test, is where the answer is correct according to an answer key previously decided by a panel of native speakers. The answer key gives a shortlist of the best acceptable alternatives for each item.

Results and Discussion

Comparison of exact word and limited acceptable word scoring methods

i) Correlation

The two differently scored versions of the test were correlated to see whether they appeared to be testing the same thing. In previous research the correlation between the two methods has been high, showing that despite the fact that students get more marks with the acceptable word scoring method, the distribution of marks is usually similar, with the same students at the top and bottom end of the scale.

Table 1: Correlations of Exact Word and Limited Acceptable Word Scoring Methods

Passage 1 (PNG fiction)	0.87 *
Passage 2 (Perfume making)	0.85 *
Passage 3 (Homing pigeons)	0.79 *
Passage 4 (Space Travel)	0.9 *

* significant at 0.001 level (23df)

The results show that, as expected, both versions of the test seem to be testing the same thing.

ii) Item analysis

Item analysis was carried out to measure the level of difficulty of test items and their power to discriminate between good and poor students. it is not usual to apply item analysis to a cloze test because the items cannot be adjusted i.e. the deletions must remain in the fixed ratio for the test to perform efficiently overall. The item analysis was carried out in this case in order to compare the effects of exact word as opposed to limited acceptable word scoring methods.

Table 2: Summary of item analysis to compare exact word scoring (EW) with limited acceptable word (LAW) scoring.

	Av.facility		Facility no.of items 40-60%		Discrimin. < .3	
	EW	LAW	EW	LAW	EW	LAW
1 PNG fiction	46%	78%	6	5	11	16
2 Perfume making	21%	50%	7	10	13	17
3 Homing pigeons	29%	53%	3	3	12	18
4 Space travel	37%	50%	4	5	13	18

It is clear from these results that limited acceptable word scoring (LAW) was superior in that it yielded a much greater number of items which discriminated well (i.e. 0.3 or greater). In addition to this, the limited acceptable word scoring gave a more appropriate level of difficulty, particularly when one takes into account the fact that the poorest prospective students who usually take the test are not represented here. On the basis of these results it was decided to choose the limited acceptable word scoring method in preference to exact word scoring.

Since cloze tests scored by acceptable word need 75 items to constitute a reliable test (Sciarone 1989), one of the passages could be eliminated. It might seem at first glance that Passage 1 (PNG fiction) should be eliminated because it was too easy, having an average item facility as high as 78% and because it represented a reading level as low as grade seven. However, it must be borne in mind that approximately the bottom 25% of the normal population is missing form this sample. In addition it must be pointed out that reading levels in PNG are notoriously low. In a recent study on the reading levels of community school teachers Mohok-McLaughlin (1990) found that only 5% of teachers doing inservice could read at grade 10 level. McLaughlin (1990), reported in Mohok-Mclaughlin (1990) had similar findings when he discovered that only 27% of a sample of 90 teachers applying for entry at U.P.N.G. could read independently at grade 10 level. For these reasons it seemed important to retain a relatively easy passage to start the test and so Passage 1 was retained.

It was decided to eliminate Passage 3 (homing pigeons) because this was the most unbalanced test passage with most of the items being either too difficult or too easy.

The new placement test then will consist of Passage 1 (PNG fiction) at grade 7 reading level (25 items), Passage 2 (Perfume making) at grade 9 reading level (25 items) and Passage 3 (Space travel) at grade 12 reading level (25 items). The placement test of 75 items will be scored by the limited acceptable word method. Comparison with the old entry test is calculated on this basis.

Table 3: Comparison of the new placement test is the old entry test

	Old entry test	Placement test
	/25	/75
mean	12.4	45.525
standard deviation	3.048	9.538
range	12	40
KR 21 reliability	.596	.905

Pearson product moment correlation -.5074 and significant at 0.001 (78df).

These results show that the new placement test discriminates much better than the old entry test and is considerably more reliable. In fact the results show that the old entry test is not reliable at all.

The correlation coefficient shows that although the two tests have something in common, there is considerable divergence between then. This indicates that they are often not measuring the same thing. If it is accepted that the cloze measures overall language proficiency, as research findings show, then it follows that the old entry test did not measure overall language proficiency. This is, however, not surprising when one considers that the old test measured only limited aspects of reading comprehension and vocabulary and included an unreliable writing component.

Conclusion

It seems that the cloze has turned out to be an appropriate method to use for the new placement test. The new test is more valid than the old entry test because the cloze procedure has been shown to be a better measure of overall language proficiency. In addition, the test is capable of objective marking which the distance education operation requires and this contributes to making it far more reliable than the old test. The new test also has a good distribution indicating that it discriminates well between levels of proficiency.

It is interesting to note that the correlation between the two tests indicates that for a large part they do not seem to be measuring the same thing. This casts serious doubt on the validity of the old entry test.

It is to be hoped that when the new placement test is evaluated as a predictor of success in Extension studies language courses, that it will be finally validated and that only minor modifications may be necessary before it appears in its final form. It can them serve students to direct them to the most appropriate starting point to continue their education.

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Research Notes

School Organisational Climate and Student Discipline

Arnold Kukari

Purpose of the Study

Concern about the breakdown of discipline in some provincial high schools of Papua New Guinea underpins this case study of two schools in Morobe Province. One of the schools was selected on the basis of reported student disturbances the year prior to the study, while the other was selected on the basis of its record of good student discipline. It was the aim of the study to examine the organisational climate of the two schools and determine whether such climate could be related to the observed differences in student discipline.

Methodology

Teachers (35) and students (80) in the selected schools were administered a questionnaire requesting them to rate the quality of: decision-making processes in the school, communication channels, planning, organising and delegation functions carried out by the administration, school/community relationships, leadership style, assistance given to staff performance and staff development, and the application of rules and regulations. Selected teachers and students were also interviewed on the same research variables. Various school records were examined relating to staff meetings, staff running file, student discipline, and information on staff notice boards. Observation of school activities such as meetings, extra-curricular activities and school day in general was also carried out and a record of day-to-day happenings was kept by the researcher.

Findings

The study showed clear organisational climate differences between the two schools. Teachers in the school with student problems characterised the school as having a `closed' organisational climate, with an authoritarian leadership style, with almost all decision-making and planning centred on the head teacher; staff and students appeared unconcerned about the school. There were serious inconsistencies in the implementation and enforcement of school rules and regulations by administration and teachers alike; no adequate procedures or guidelines existed for dealing with school problems.

The school with few student problems was characterised on the contrary as having an 'open' organisational climate. Teachers and students were encouraged to participate in decision-making and planning and their potential was used by the school administration. Teachers felt satisfied with their job requirements. There were good communication channels, and the school was perceived as having a good relationship with the community. Equally, there were clear guidelines and procedures for dealing with student problems.

The researcher concludes with a series of policy recommendations derived from the study.

(Available in the Michael Somare Library, University of Papua New Guinea).

The Feasibility of Universal Primary Education for the Southern Highlands Province in Papua New Guinea.

Sam Kari

Purpose of the Study

The concern was to examine what conditions exist for the implementation of Papua New Guinea's policies of Universal Primary Education for the year 2000 in the province of the Southern Highlands

Methodology

The study looked at the schooling conditions in the Province, the perceptions of teachers, parents and school drop-outs on the feasibility of Universal Primary Education and inquired also about the degree of planning for Universal Primary Education on the part of the provincial educational authorities. A survey including teacher questionnaires and interviews was applied to a stratified random sample (by type of school, rural or town); also an interview survey of views was conducted with 50 parents and 45 dropouts from school selected within the Ialibu district of the province.

Findings

Examination of the schooling conditions, and views expressed by teachers, parents and dropout students, as well as consideration of existing policies, allowed for the following conclusions to be established regarding favourable and unfavourable conditions of the success of Universal Primary Education. Among the favourable conditions, the existing number of schools (149) was considered enough to accommodate an expanded school population, provided some measures were taken to correct the current uneven distribution favouring the sectors close to town. It was also considered that the existing teacher pupil ratio of 1:29 could be raised to accommodate the children to about 1:35.

Among the unfavourable conditions affecting the quality of teaching and therefore school retention, the most important ones appear to be the poor conditions of service of teachers, and shortage of essential teaching materials. The Provincial government did not appear to have yet developed clear plans for the implementation of Universal Primary Education policies, and administrators interviewed indicated that they did not think Universal Primary Education could be possible in the province. There were plans, however, for establishing boarding primary schools and *tokples* pre-schools with the aim of improving quality and retention. Contrary to opinions given by administrators parents and teachers strongly support Universal Primary Education policies. On why they had not remained in school till the completion of sixth grade, former students interviewed indicated as reasons poor parental support (material), the experience of corporal punishment, and extended absences due to sickness or other causes. They all, however, believed that Universal Primary Education should go ahead.

Policy recommendations are included in the study.

(Available in the Michael Somare Library, University of Papua New Guinea).

THE EDITOR

BOOK REVIEW

Evans, T. (ed.) (1990) **Research in Distance Education One.** Geelong: Deakin University.

Don't let the title of this valuable book put you off. While it is a series of essays compiled on the occasion of a conference about research issues in distance education, an admittedly narrow audience, it has much to say to the general educator. It is a very good introduction to the world of hermeneutical and phenomenological critiques of education and education research that can be understood by even the neophyte. That it is also applied to distance education is an added advantage. The book is a must for any educator wanting to make a difference in Papua New Guinea, whether in distance education or any other field of education, because it brings into question many of the assumptions and values that guide educational research and planning in this country. The compilation is divided into two parts. The first part consists of articles devoted to theoretical issues confronting researchers in distance education. The second part includes essays dealing with specific case studies.

The first article by Alistair Morgan introduces the various theoretical debates surrounding research in distance education. He refers to the traditional survey approach to research as "mindless data collection" and traces its justification to the theoretically naive educational technology approach. Educational technology is a rational and systematic problem-solving approach to curriculum development that includes identifying objectives, developing experiences, evaluation and improvement. The problem with the approach, argues Morgan, is that it describes the learning experience from the outside, from the perspective of the provider.

Morgan describes the beginnings of a silent revolution occurring in educational research that seeks to discover what the learning experience means to the student and how distance education can emancipate the learner. He discusses the phenomenological approaches to qualitative and illuminative studies as well as critical theory and action research based on the work of Habermas.

The next essay by Margaret Grace is a veritable bibliography on hermeneutic theory in educational research. She draws on virtually everyone from Husserl and Gadamer to Ricoeur and Habermas in describing the importance of a hermeneutic process for educational research. It is rare to find so clear and inclusive a review of this conceptually challenging field.

She begins by reminding us that the word hermeneutic is derived from the Greek Hermes, messenger of the gods and decipher of messages. She goes on to describe the details of its philosophical evolution and concludes with an illuminating and practical application of hermeneutics to the interview situation. Quoting an astonishing variety of current authors, she neatly sums up the very active interpretive role of the interviewer.

Grace describes the radical approaches of phenomenology, hermeneutics and feminism as essentially a concern for the problematics of meaning and subjectivity. She avoids the usual trap of framing the discussion of these approaches in a critique of mainstream and positivist social science. Instead she focuses on the challenges, the excitement, and the new horizons opened up by these radical approaches.

This essay alone, if carefully read, should suffice as a challenge to the notion of distance education as the "large-scale production of instructional packages for consumption by masses of students" that seems so influential in Papua New Guinea. If it is not, then the essay by Mick Campion will probably finish the job.

In his essay entitled "Post-Fordism and Research in Distance Education", Campion draws an intriguing connection between conceptions of the manufacturing process and distance education. He argues that the mass production mentality (Fordism) that dominated industry after the Second World War also dominated other aspects of social thinking, including distance education.

The main concern of Fordism is for centralization, vertical integration, standardization and volume-all in search of economies of scale. Fordism is characterized by low product innovation, low process variability and low labour variability. Modern industry, however, is now being forced to consider issues of quality, innovation, variability and worker responsibility.

Campion argues that in the Post-Fordism era, we must consider a "more decentralized, democratic, participatory, open and flexible" education system as economically viable and administratively efficient. He also points out that the Post-Fordism era brings with it a new consumerism. No longer are consumers or workers (students) willing to endure the tyranny of the production line. Campion sets out to stimulate debate about the dominant paradigm which currently constrains thinking about distance education. He succeeds brilliantly with this engaging application of ideas from industrial planning.

Another stand out essay in the first part of this compilation is that of Chris Bigum. Hiding behind the pedantic title, "Chaos and Educational Computing: Deconstructing Distance Education", is another innovative challenge to conventional thinking about distance education (and education in general for that matter). Bigum argues that the physical sciences have abandoned the positivism of Newtonian physics and replaced it with the relativity and indeterminancy of quantum mechanics and chaos theory. Yet the social sciences, including educational research, are still struggling to ape the methodological and conceptual constraints of Newton.

Bigum challenges researchers in distance education to deconstruct common assumptions about the proximity of the learner and the value of ordered information systems. He suggests that we should think of teachers as managers of mess instead of solvers of problems. This is really stimulating reading.

The second part of the book is devoted to practical examples of radical research into distance education. It is very interesting to compare the self-consciousness of these researchers and the methodologies they choose to what goes on in Papua New Guinea.

One essay in the second section, which might just as well have been included in the first, is that by Ellerton and Clements entitled, "Culture, Curriculum and Mathematics Distance Education". It is a rigourous and convincing look at research and thinking that suggests mathematics is not objective but culture bound. Quoting the likes of Popper, Godel and Wittgenstein, the authors argue a convincing case that mathematics is not the universal, objective science many think it to be. This has tremendous relevance to a country like Papua New Guinea with many of its over 700 indigenous counting systems still surviving in the villages.

The physical presentation of the book is attractive. Pages are laid out in readable fashion with good sub-headings and wide margins. One small but annoying problem is an occasional double spacing between words in the body of the text. There are sixteen chapters in the book and the references are combined at the back in a twenty-two page bibliography.

There is a quality of thinking in this book that far exceeds what one usually finds in conference proceedings. This book is so unusual in its quality and scope, in fact, that it has moved this author to do two rare things. The first was to actually read the book from cover to cover. The second was to order a personal copy of the book.

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